Journal
OF THE AMERICAN VETERINARY MEDICAL ASSOCIATION

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Vol. 128 **January 15, 1956** **No. 2**

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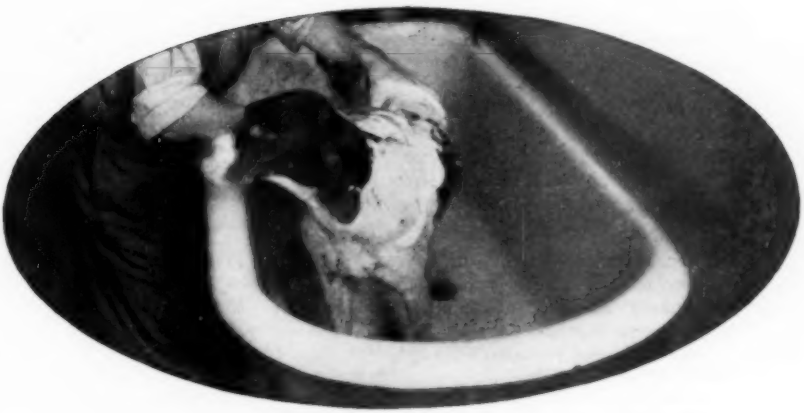

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Veterinary Medical Activities

✦ The Board of Governors (J. M. Arburua, chairman; Floyd Cross and Wayne O. Kester) met at Association Headquarters, Dec. 15, 1955.

* * *

✦ President Floyd Cross, President-Elect Wayne O. Kester, Executive Board members W. G. Brock and F. B. Young and Executive Secretary J. G. Hardenbergh represented the AVMA at the meeting of the American Equine Practitioners Association held in Chicago on December 16 and 17.

* * *

✦ President Floyd Cross participated in the program of the University of Pennsylvania Veterinary Conference in Philadelphia, January 3-4, and of the Cornell Veterinary Conference, January 5-6.

* * *

✦ President-Elect Kester participated in the program of the Delaware V.M.A., Wilmington, on December 7; of the Ohio V.M.A., Columbus, on January 4-6; and of the Oklahoma V.M.A., Tulsa, on January 9-10.

* * *

✦ The AVMA Emergency Advisory Committee met in Washington, D.C., on December 13 to discuss anticipated needs for veterinary officers by the Armed Forces as well as civil defense matters. Those attending the meeting were Drs. W. R. Krill, chairman, J. B. Engle, W. R. Hinshaw, H. E. Kingman, Jr., Frank A. Todd, C. D. Van Houweling, Brigadier General E. W. Young, President-Elect Wayne O. Kester, and Brigadier General J. A. McCallam.

* * *

✦ Editor-in-Chief W. A. Aitken participated in the program of the Ohio V.M.A., Columbus, on January 4-6.

* * *

✦ Assistant Executive Secretary H. E. Kingman, Jr., participated in the program of the Indiana V. M. A., Indianapolis, on January 11-12.

* * *

✦ President Cross and Assistant Executive Secretary Kingman attended the annual Greenbrier Conference sponsored by the National Association of Manufacturers on January 13-15, held in White Sulphur Springs, W. Va.

* * *

✦ About 20 officers of the Army and Air Force Veterinary Corps, who attended the Dairy and Meat Hygiene School at the Quartermaster Depot, visited Association Headquarters, Dec. 21, 1955. Members of the AVMA staff spoke to the group on the organization and activities of the Association and other professional matters.

* * *

✦ Dates for meetings of advisory group to review the brucellosis program for U.S.D.A. have been changed from those reported in "News from Washington" (*see* January 1 issue of JOURNAL, p. 8). Meetings will be held in New York City, February 13; Atlanta, Ga., February 15; and Chicago, February 17. Other dates remain as previously planned.

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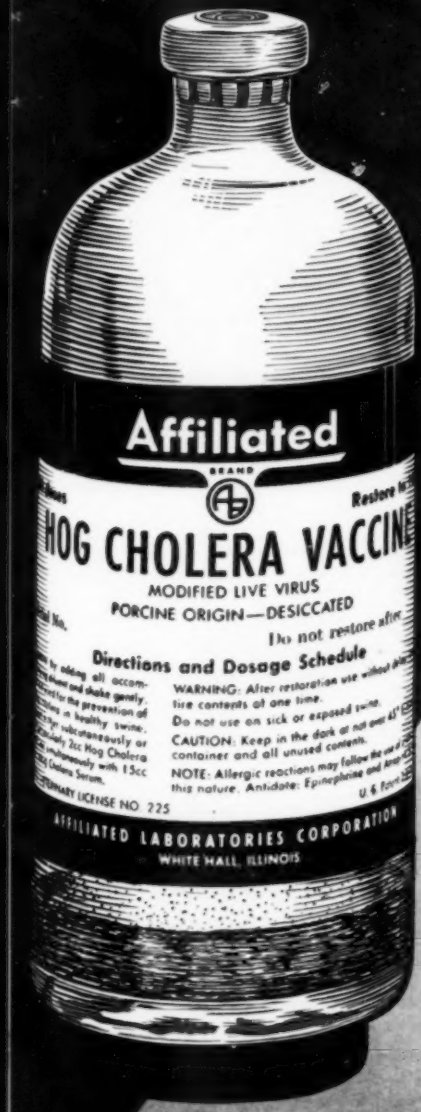
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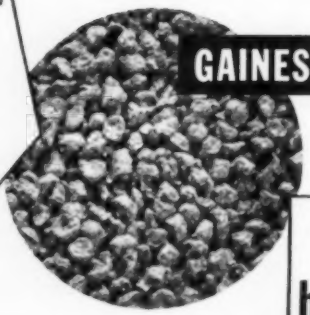

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1. Grumbles, L. C., Wills, F. K., and Boney, W. A.: J. Am. Vet. M. A. **124**: 217, 1954. 2. Smith, H. W.: Vet. Rec. **66**: 215, 1954. 3. Cosgrove, A. S.: Vet. Med. In press.

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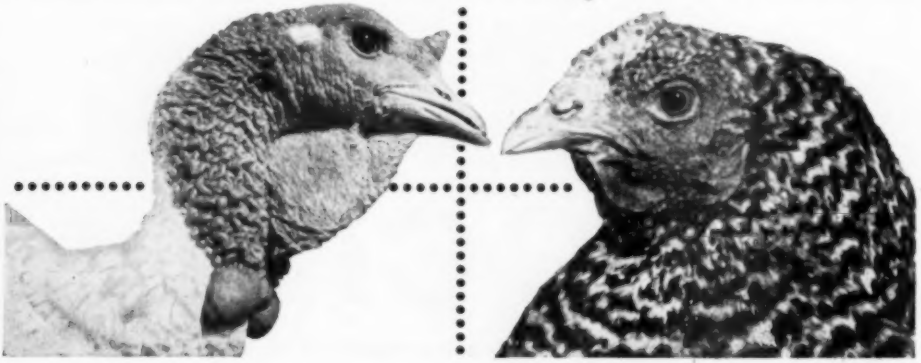

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Toxin in the Blood of a Dog with Tetanus

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Guelph, Ontario

THE DOG IS comparatively resistant to the effects of tetanus toxin. Fildes[1] estimates that the dog, in proportion to weight, is 300 times as resistant to tetanus toxin as is the horse. Topley and Wilson[2] report that the dog is 50 times as resistant to the toxin of *Clostridium tetani* as is the mouse. Reports of tetanus in the dog are few in North America; there are none reported in the annual reports of the Ontario Veterinary College. Kirk[3] indicates that the disease is uncommon in dogs in the United Kingdom and in Europe. Seneviratne and Pillai[4] report that the disease is rare in dogs in Ceylon. Aranez,[5] in eight years, saw only one case of tetanus in the Philippines. The paucity of reports in the literature suggests that canine tetanus is a rare disease throughout the world. The exception to this is western Australia where Hogarth[6] states that ". . . throughout the year and from year to year, tetanus is regularly seen in dogs in the course of practice in Perth-Fremontle area. The prognosis is good and mortality is low."

Fig. 1—A German Shepherd with tetanus, showing the ears drawn together, the skin on the top of the head wrinkled, and rigidity of the tail.

Tetanus in dogs has been reported by Ripps,[7] Blake,[8] and Newbury[9] in the United States in recent years. The majority of reported cases cover clinical symptoms and

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The authors appreciate that Dr. C. Sayers, veterinary practitioner in Georgetown, Ont., referred the case to the Ontario Veterinary College.

Fig. 2—This mouse, inoculated with 0.5 ml. of blood from the German Shepherd, has ascending paralysis.

treatment with no reference to bacteriological examination. Moss and McGaughey,[10] in their review of the literature, indicate that of 47 cases of canine tetanus from 1900 to 1943, only 3 had been examined bacteriologically.

Because of the infrequency of the disease in Canada and the fact that the organism and its toxin was demonstrated, it is considered worthwhile to record this case.

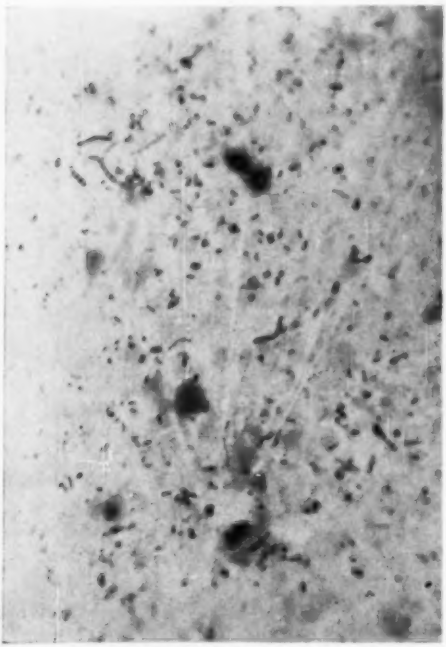

Fig. 3—"Drumstick" bacilli in smear taken from the scar on the hindleg of the German Shepherd.

CLINICAL DESCRIPTION

On Nov. 6, 1954, a female German Shepherd was struck by a car. The resulting coxofemoral luxation was reduced by a local veterinarian. A superficial wound on the left hock was not treated. Ten days after the injury, the dog showed signs of tetany.

Twelve days after injury, when the dog was referred to the Ontario Veterinary College, its mouth could not be opened although it could lap water with difficulty. The pupils were contracted, the ears drawn together, the skin wrinkled over the top of the head (fig. 1), the tail was rigid (fig. 1), and the limbs were stiff. There were intermittent tremors of the facial muscles. A tentative diagnosis of tetanus supported that of the local veterinarian. Treatment consisted of tetanus antitoxin, penicillin, and pentobarbital sodium to effect. Five milliliters of blood was removed from the cephalic vein for laboratory examination. The dog died eight hours after admittance. Necropsy revealed no gross pathological changes. Cerebrospinal fluid and the scarred leg were removed for laboratory examination.

LABORATORY EXAMINATION

The white blood cell count was 15,000 per cubic millimeter and the differential blood count was: 69 per cent segmented; 22 per cent band; 8 per cent lymphocytes; and 1 per cent monocytes.

Six white mice were inoculated in a hindleg with 0.5 ml. of blood removed from the cephalic vein of the dog. In 36 hours, the mice showed symptoms of progressive, ascending paralysis (fig. 2) and died in tetany in 48 hours. No evidence of bacterial infection was found in the mice. Six white mice inoculated similarly with 0.5 ml. of blood from normal dogs showed no ill effects within 21 days. Cerebrospinal fluid removed at necropsy produced no ill effects when inoculated into white mice.

Microscopically, material from the scarred area on the hock revealed numerous gram-positive rods with terminal spores. The morphology was typical of *Cl. tetani* (fig. 3).

No growth was obtained on bacteriological cultures from the internal organs.

DISCUSSION

The demonstration of "drumstick" bacilli in a wound from an animal showing

symptoms of tetanus is probably not pathognomonic of infection with *Cl. tetani*. A search of the literature has not revealed a similar clinical case in the dog in which tetanus toxin was demonstrated in the circulating blood.

A great deal of investigation has been done to determine the route that tetanus toxin takes in reaching the central nervous system. Morax and Marie,[11] Meyer and Ransom,[12] Teale and Embleton,[13] and Speransky[14] believe that the toxin travels up the perineural spaces or axis cylinders to reach the central nervous system, while Abel *et al.*,[15] Spaeth,[16] and Robertson[17] indicate that the toxin is spread to the central nervous system by the hematogenous route.

This dog showed unequivocal evidence that toxin was present in the blood stream, but whether it produced its effect on the central nervous system via this route, we can not say. Histopathological observations on the brain did not indicate any changes suggestive of tetanus. Baker[18] reports that in 12 cases in man, when symptoms were present for three days, definite alterations occurred in the central nervous system. Perivascular demyelination appeared after the fifth day of illness. Baker[18] suggests that this strengthens the belief of Abel *et al.*[15] in a hematogenous spread of the tetanus toxin.

The tetanus toxin was not demonstrable in the cerebrospinal fluid of the dead animal. However, tetanus antitoxin had been administered before death and several hours had elapsed before necropsy.

SUMMARY

A brief review of the literature on canine tetanus is presented. A fatal case of tetanus in the dog is described. Evidence of the presence of the organism in the wound and the toxin in the blood stream is reported.

References

[1]Fildes, P.: System of Bacteriology. M. Res. Council, *3*, (1929): 298.

[2]Wilson, G. S., and Miles, A. A.: Topley and Wilson's "Principles of Bacteriology and Immunity." Vol. 2. 3rd ed. Edward Arnold and Co., London (1946): 1746-1769.

[3]Kirk, H.: Index of Treatment for Canine and Feline Surgeons. 2nd ed. Bailliere, Tindall and Cox, London, 1951.

[4]Seneviratne, P., and Pillai, P. B. K.: Tetanus in Dogs: Treatment of Three Cases. Ceylon Vet. J., *1*, (1953): 36-38.

[5]Aranez, J. B.: Tetanus in a Dog. J.A.V.M.A., *125*, (1954): 450.

[6]Hogarth, T. W.: Tetanus in Dogs. Austral. Vet. J., *26*, (1950): 338-339.

[7]Ripps, J. H.: Tetanus in Dogs—A Case Report. J.A.V.M.A., *123*, (1953): 119-120.

[8]Blake, W. E.: A Case of Canine Tetanus. J.A.V.M.A., *126*, (1955): 60.

[9]Newury, F. L.: A Case of Tetanus in a Dog. J.A.V.M.A., *126*, (1955): 396.

[10]Moss, J. E., and McGaughey, C. A.: Vet. Rec., *55*, (1943): 258.

[11]Morax, V., and Marie, A.: Recherches Sur L'Absorption de La Toxine Tetanique. Ann. Inst. Pasteur, *16*, (1902): 818.

[12]Meyer, H., and Ransom, F.: Untersuchungen Uber den Tetanus. Arch Exptl. Path. and Pharmacol., *49*, (1903): 369.

[13]Teale, F. H., and Embleton, D.: The Paths of Spread of Bacterial Exotoxins with Special Reference to Tetanus Toxins. J. Path. and Bact., *23*, (1919): 50.

[14]Speransky, A. D.: Le Role due Systeme Nerveaux Central dans Les Processus Morbides Locaux. Ann. Inst. Pasteur, *42*, (1928): 179.

[15]Abel, T., Hampel, B., and Jonas, A.: Researches on Tetanus; Further Experiments to Prove that Tetanus Toxin Is Not Carried in Peripheral Nerves to Central Nervous System. Bull. Johns Hopkins Hosp., *56*, (1935): 317.

[16]Spaeth, R.: Serum Therapy of Tetanus. Am. J. Dis. Child., *61*, (1941): 1146.

[17]Robertson, H. E.: The Distribution of Tetanus Toxin in the Body. Am. J. M. Sci., *152*, (1916): 21.

[18]Baker, A. B.: The Central Nervous System in Tetanus. J. Neuropath. and Exper. Neurol., *1*, (1942): 394.

Veterinary History in the College Curriculum

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From time to time, attention is drawn to the fact that little consideration has been given to the history of veterinary medicine. This is essentially as true of those who determine what shall be included in the veterinary curriculum as of the average practitioner. The problem is a cyclic one. The lack of attention to veterinary history has hindered the development of the subject as a discipline, and because the subject is not regularly taught, relatively few acquire a taste for it.

Much could be said concerning the value of a study of veterinary history, for its own sake, as a liberalizing influence in a technical curriculum, or as an introduction to professional ethics; but veterinary his-

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tory also happens to be veterinary medicine itself. Thus, those who might be concerned lest an already crowded course of study be further overcrowded with an "alien" subject, can be assured that veterinary history is a professional as well as a cultural study.

A series of lectures on the general history of veterinary medicine was offered on an informal basis last fall (1954) to the first-year class at Michigan State University. More than half of the class attended these lectures voluntarily. The series was continued during the winter quarter as an elective course with the option of doing library work for additional credit. A small group asked to have the work continued, and in the spring quarter a seminar course was based upon the papers which had been written the previous term. Upon the basis of the year's work, the veterinary faculty has authorized a required three-credit course of lectures on the history of veterinary medicine for the first-year class.

The course has naturally required a great deal of literary research, there being no suitable general history of veterinary medicine in English. This library study has demonstrated that the average university library contains a wealth of historical material. There are enough readily available general sources, which are listed below, to permit the development of a series of lectures in a relatively short period.

A questionnaire submitted to the deans of the veterinary schools has indicated that there is considerable latent interest in the subject of veterinary history. It would, therefore, appear logical to take some steps toward establishing this study as a regular discipline. To start on the broadest basis, it would be desirable that a general awakening of interest in history be encouraged on the part of veterinary students and graduate veterinarians. Current journal articles on historical topics, and the short history of veterinary medicine in America (Bierer) recently published, constitute the most readily available means of promoting widespread interest. A number of veterinary schools offer a few lectures in the area of veterinary history. With additional effort by one or more interested staff members on each veterinary faculty, something of the stature of a course may be realized. A planned program of library reading on the part of students would be a logical parallel to a series of lectures.

Some progress is being made toward the compilation of a general history of veterinary medicine to serve as an introduction to the subject. As interest in veterinary history increases, the full development of the subject as a regular discipline will require the acquisition of original source material by libraries or by individuals with a special interest in this area. It is perhaps not too visionary to look forward to the eventual establishment of chairs of veterinary history in our veterinary schools, or the possibility of a journal section of the history of veterinary medicine. The elevation of the subject to a discipline in its own right may attract classical scholars to the task of unlocking the rich store of ancient literature which remains to be translated.

The following list of sources is necessarily incomplete, being restricted to works in English which will provide a ready access to the literature:

Books

Bierer, Bert W.: A Short History of Veterinary Medicine in America. Michigan State University Press, 1955.

Fleming, G.: Animal Plagues. 2 vol. London, 1871, 1882.

Houck, U. G.: The Bureau of Animal Industry of the United States Department of Agriculture, Washington, D.C., 1925.

Merillat, L. A., and Campbell, D. M.: Veterinary Military History. 2 vol. Chicago, 1935. (This contains a wealth of information on civil as well as military veterinary history.)

Smith, Gen. F.: The Early History of Veterinary Literature and Its British Development. 4 vol. London, 1919, 1924, 1930, 1933.

Journals

Practically any volume of the veterinary journals before 1900 will contain articles of historical interest. These include:

The Veterinarian (London), from 1828.

American Veterinary Review, from 1877 (now J.A.V.M.A.).

Journal of Comparative Medicine and Surgery, from 1881.

Journal Articles

Arburua, J. M.: History of Veterinary Medicine in the United States. J.A.V.M.A., *85*, (1934): 10-38.

Campbell, D. M.: Development of Veterinary Medicine in North America. Vet. Med., 29: in installments beginning January, 1934.

Hagan, W. A.: Veterinary Medical Education—Its Evolution and Present Status. J.A.V.M.A., *118*, (1951): 287-292.

Huidekoper, R. S.: Introductory Address. Am. Vet. Rev., *8*, (1884): 377-396; also in J. Comp. Med. and Surg., *6*, (1885): 1-19.

Hughes, D. A.: American Veterinary History—

Its Meaning and Scope. Am. Vet. Rev., *39*, (1911): 163-175.

Jennings, R.: Early History and Progress of Veterinary Medicine and Surgery in the United States. J. Comp. Med. and Surg., *4*, (1883): 42-49; *ibid.*, *5*, (1884): 24-32.

Liautard, A.: History and Progress of Veterinary Medicine. Am. Vet. Rev., *1*, (1877): 5-19.

Merillat, L. A.: Historical Sketches and Memoirs. J.A.V.M.A., *108* and *109:* in installments beginning June, 1946.

Schuman, M.: History of Veterinary Medicine. Southwest. Vet., *7*, (1954): 223-228; 332-337.

Smithcors, J. F.: Why Study Veterinary History. M.S.C. Vet., *15*, 12-17, (1954): 12-17.

Smithcors, J. F.: The Family Tree of the Veterinarian. Vet. Med., *50*, (1955): 525-536.

Smithcors, J. F.: The Veterinary Medicine of Ancient Civilizations. M.S.U. Vet., 16, (Fall, 1955): 13-24.

The Problem of Animal Disease Reporting and Vital Statistics

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Recently there has appeared a series of publications dealing, in one way or another, with the problem of vital statistics in veterinary medicine. Two of the most pertinent are:

1) "Losses in Agriculture—A Preliminary Appraisal for Review," by the Agricultural Research Service, U. S. Department of Agriculture, Washington, D.C., June, 1954.

2) Otis Emik: Some Advantages to Be Expected from Organized Animal Disease Reporting Program. Vet. Med., *50*, (1955): 119-122.

The validity of any statistical analysis of a problem depends fundamentally upon the accuracy of the initial data. Particularly in those areas where the evaluation of the data involves extensive use of the multiplying bar on the calculating machine or the insertion of dollar economics into the problem, the imponderables become so large that distortion of the essential facts is easy.

In veterinary medicine there are, roughly, three categories of disease, using a classification which is based on the accuracy of the diagnostic procedures available and the veterinary coverage of these diseases.

Category 1—The first category includes diseases with accurate, effective methods of diagnosis by suitable laboratory or, rarely, by field procedures, *i.e.*, vesicular exanthema, sheep scab, Texas fever, brucellosis, and tuberculosis. With these diseases, the procedures are a matter of law or administrative regulations. The diseases themselves are so important that each veterinarian submits proper samples for laboratory analysis from all suspect cases and the government usually finances the laboratory and, in many cases, pays for the special inspection services. Accurate data from these diseases are entirely feasible. The coverage by the inspecting and reporting services are sufficiently adequate that most cases sooner or later come to official attention.

Category 2—In this category are diseases which are easily diagnosed accurately by veterinarians in the field, using characteristic symptoms or lesions or readily available laboratory procedures, *i.e.*, listeriosis, coccidiosis, mange, ringworm, internal parasitosis, epidemic tremor, and foot rot. It is difficult to get adequate information on cases in this category. The easier the disease is to diagnose, the more likely the farmer is to undertake his own treatment or salvage. For instance, animals with "over-eating disease" which do not die at once are usually salvaged by the owner. In general, the farmer usually treats recognizable parasitoses. The practitioner often sees only the misdiagnoses and obstinate cases in this category and it is generally difficult to get a true history. Competent diagnoses tic coverage of these cases is rare because only sporadically do they come to veterinary attention.

Category 3—In the third category are diseases which are rarely clearly defined but which the practitioner treats on the principle of maximum likelihood therapy. If the therapy is effective, he never knows for sure just what the exact trouble was. For example, it is difficult to distinguish clinically between early stiff lamb disease and early stages of the subacute tetanus frequently seen after use of an elastrator. A wise practitioner administers both tetanus antitoxin and vitamin E. A number of diseases cause fever in hogs. Yet the careful practitioner, because of the prevalence of hog cholera, usually proceeds on the assumption that he could be dealing with this disease and administers anti-hog cholera serum in addition to such other therapy as he may deem necessary. Successful treatment of pneumonia, poisoning, diarrhea, indigestion, and mastitis is often done on a probability basis and the exact etiological agent may never be known. A veterinarian rarely has time to get specimens from all such cases for laboratory diagnosis, and rarely are the necessary enormous laboratory staffs and facilities available for such work. Moreover, the economic factor sends many animals with undiagnosed ailments to the butcher or the rendering plant as not worth the effort to treat them.

Because of the efficiency of the veterinary services in North America, diseases in category 1 are relatively rare while the diseases in categories 2 and 3, especially those due to mismanagement, are much more common. The idea of presenting

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these categories is not to indicate that there are hard and fast boundaries between them. (Early hog cholera could possibly be in category 3; practically all outbreaks are in category 2; but if a real control program is ever undertaken it will belong in category 1.) It is to emphasize the point that only in a relatively small area of effective veterinary practice is an exact etiological diagnosis ever to be made. This means then, in essence, that the collection of inexact data is almost inevitable under the present economic limitations in veterinary medicine. For practical purposes the opinions, advice, and experience of first-rate veterinarians are much more likely to be accurate than any raw data which could be collected by any reporting system. This in no degree indicates any disparagement of the veterinary profession which has to operate under a strict economic ceiling. The farmer simply can not pay for exacting diagnostic tests comparable to those applied to a human patient in a medical hospital. The veterinary profession is rendering a splendid service, but it must be an economical service. Even in human medicine, the existence of the effective antibiotics and sulfonamides has made it difficult to collect any sort of efficient diagnostic data in those diseases characterized by high fever and relatively little else in the initial syndrome.

If one studies the detailed reports of many of the veterinary colleges and diagnostic laboratories in North America, one must be impressed that the overwhelming cause of mortality, and a not inconsiderable portion of the morbidity, is due basically to mismanagement somewhere in the animal industry. The veterinary profession today not only knows what its major problems are but also is acutely aware of the fact that control devices, particularly for diseases in category 2, are presently available and in many cases have been available for a long time without effective measures being taken. One example is the problem of hog cholera. While Canada has been essentially free of the disease for decades, it is still one of the major headaches in the United States.

It has been known for many years that the feeding of raw garbage to hogs was an important means of spreading cholera. The statistical data which indicated that human trichinosis also was basically a garbage-feeding problem has been in the literature since the end of the last century. Yet it was not until a third disease was added to this category that the cooking of garbage was made a matter of state regulation in this country. Vesicular exanthema was known to be highly contagious. A number of years ago it was restricted to one state, yet the disease was allowed to spread across most of North America before any effective campaign of eradication was undertaken. One of the chief control devices has been garbage-cooking regulations.

It has been known for many years that scrapie is a contagious disease. We had ample warning that the disease had been imported into Canada from England a number of years ago. Yet the prohibition of importation of sheep from infected countries was not undertaken until recently. The lancet fluke was imported into New York State a number of years ago and allowed to spread unchecked in spite of repeated warnings. It is likely to continue to spread across most of temperate North America since control is now practically impossible. The plain and demonstrable fact is that we have plenty of statistical information available regarding the kind and cause of a great many diseases of our domestic animals and, in spite of this information, little is done about many of them either at the farm, the state, or the federal level. Until it is possible to do something effective about the major problems that still confront the livestock industry, any deviation of time, money, and personnel into senseless piling up of reams of figures is a disservice to that industry.

If all the wonderful things that Mr. Emik promises, resulting from a complete reporting system, were true and not wishful thinking, the reporting system of diseases in category 1 should have produced these benefits many times over because of the tremendous threat that these diseases always hold over the livestock industry. As a matter of fact, the reporting system for these diseases is, with the current mechanism, inadequate. We have had, for example, six outbreaks of sheep scabies in New York State in the past year but no outbreaks for some time prior to that. These outbreaks have occurred in spite of the fact that sheep scabies has been a reportable disease in most of the states for many years, yet the source of our trouble is still not known. Rabies is a current problem in North America and it, too, has been a reportable disease for a long time. One could extend the list considerably. This is not to

say that reporting of these diseases is not a necessary and useful adjunct to their control. It is to point out, however, that the exorbitant benefits promised by Mr. Emik have in no way been realized merely because of the piling up of the figures. A pile of statistics has been compared to a pile of dead fish. If they are not promptly used they become a menace to the entire neighborhood.

The mere assemblage of figures, however impressive, does little to influence legislators. A legislator, in designing laws, hears testimony from groups with varied interests who may manipulate the same figures to illustrate radically different points of views. (The modern view that devotees of Ananias can be subdivided as liars, damliars, and statisticians has considerable justification.) To the legislator a voter is real, an abstract figure is not. Should we sacrifice our position, which is our knowledge of veterinary problems at the grass roots level, for a mass of statistics?

A number of years ago, I prepared a short essay on the subject of vital statistics in veterinary medicine (*J.A.V.M.A., 119,* (1951): 267), pointing out certain fallacious assumptions which were accepted as valid by all of the proponents of such elaborate schemes. In that paper, I carefully stated that the diseases in category 1 were not included in my general condemnation of these current schemes for animal disease reporting. Since that time, there has been no refutation publicly or privately of my argument. The first point I made was that veterinary medicine, and to a large degree the animal industry, already knows what its major problems are and in many cases already knows the solutions for these problems. It also is cognizant of the areas where further research needs to be done. The failure to put into practice the knowledge which we already have and the worthwhile figures that are currently available is essentially a failure of human nature. Utopian plans such as Mr. Emik's will not overcome this basic difficulty. Until performance is better on the basis of the data that have already been accumulated, it is difficult to see how any cure can result from the mere accumulation of more data.

The second point that I made in the previous paper was that present statistical knowledge was really not competent to handle the special problems presented by veterinary medicine. I do not wish to elaborate the difficulties in the area, but the fact remains that current statistical theory is hardly adequate to handle the elaborate masses of data from human institutions. Statistical theory needs to progress a great deal further before it can adequately handle the peculiar distributions extant in veterinary medicine.

In that same report I indicated that I was dubious about the advantages to be obtained by the introduction of dollar economics in evaluating the animal disease losses. The Agricultural Research Service, in its above quoted appraisal for review, introduced dollar economics in the situation, however. On the very first page, the following statement is made: "The committee points out that the dollar valuation at the time of these losses is not to be interpreted as meaning the financial loss to the farmers themselves resulting from the damages described. The committee gave no consideration to the price reductions that might have resulted from the larger crops that could have been produced if these losses had not been incurred. The only reasons for placing dollar evaluation on these losses is that the financial value of the quality or the quantity destroyed or injured is the only common measure that could be used." Essentially, this means then if one is to compare losses in field crops with losses in the animal industry, the common figure generally has to be reduced to dollars and cents, but the dollar in this case does not have any real value—it is a "baloney" dollar. Nevertheless, in an increasing number of publications and speeches in recent months these dollar figures have been quoted as if they were a real net loss.

We have available one interesting example of the great complexity of the result when true dollar figures are actually introduced into a disease loss situation. We had, some years past, a rather limited livestock enterprise which produced over 70 per cent of the total industry's product within a one-county area. This enterprise suffered a 15 per cent mortality loss. Research specialists from our institution went into the area, found the cause of the loss, and developed an inexpensive serum which prevented it. Now as far as the over-all industry was concerned, the effect of the introduction of this treatment was to break the market. The first year that the serum was introduced on a wide scale, the producers suffered negligible losses from disease, but their net income was almost exactly the same as in the previous year with a 15 per cent loss. This was due to the fact that average market break due to oversupply was 15 per cent. Supplies of the product backed up in cold storage in overwhelming amounts for a considerable period.

There is no question but that ultimately there was a net gain to all of these producers because their product was competitively much better situated with other animal products as the result of this research. The producers themselves were so enthusiastic about the results that they went further and contributed out of their own pockets in order to finance more research and investigation in their area. The true net gain either to the producer or to the American public as a whole could not be obtained by any simple multiplication of the 15 per cent loss by the current value of the animal product per pound.

In spite of the Agricultural Research Service's warnings on the subject, this is the interpretation that careless scientists and many laymen placed on the actual loss. There are two menaces presented by the serious use of "baloney" dollars. One is that the "baloney" dollar is so subject to manipulation that it may distort the relative importance of a single disease and channel research and control into an area of less importance. The

other is that it may be used to sell a program on the "baloney" dollar basis which will never be realized on a real dollar basis and thus condition the industry against control in any form. If a farmer has to put $1.00 of hard cash into a control program, he should get at least $1.04 back. His return should be in real, not "baloney," money.

In concluding my article, I pointed out that I was reluctant to see my profession reduced to one pipe on somebody's propaganda organ. This is not an overstatement of the interpretation which is currently being placed on the ARS report, as can be seen from the following quotations: The ARS report says "the specialists who made the estimates stated that many of them represented only the individual judgment of the staff members with little scientific or survey data as a basis. Accordingly, the report is issued for review by experiment station staffs and others interested. It is released to the public with a caution that future estimates may modify the figures very materially."

I have in my possession a brochure from a so-called nonprofit organization, in which not only are the dollar figures for worm losses from the ARS report quoted as eternal verities, but also the attitude toward the ARS report is indicated by the following statement: "It is of primary importance that all of those associated with the industry become familiar with the new livestock parasite morbidity and mortality losses. These losses are no longer well-founded guesses or estimates, they're real and they're increasing." This is a startling interpretation at best.

Diversion of the limited funds currently available for animal disease investigation and control, and extension generally, should be looked on with considerable apprehension. We already have sufficient data available to define the major problems in animal health; we already have a research staff which is competent to investigate the areas that need research provided they are given proper financial support. We have in this country many well-trained veterinarians who can handle properly designed programs of control of disease if they are also given both financial and industrial support in their operation. The professional and agricultural extension services are equipped to disseminate the information that is already available. We surely do not need to divert our time, energy, and money into the compilation of figures whose basic data must almost by definition be faulty. We do not need to provide commercial organizations with large rows of zero figures to aid them in selling their product. There are too many real tasks before the animal industry and the veterinary profession to divert any of their energies. Progress comes by understanding and hard work not by building castles in the air with Utopian plans.

Tetanus Toxoid Given Intranasally

Forty persons who had received one or more subcutaneous doses of tetanus toxoid from one to 13 years previously were given a recall dose of 2 drops of concentrated toxoid in each naris. Only five of the 40 showed even a mild reaction but the antitoxin titer of the majority increased satisfactorily.—*Canad. J. Pub. Health, Aug., 1955.*

Ovine Brucellosis in Australia

Unilateral or bilateral epididymitis of rams, resulting in infertility, is the only recognizable sign of brucellosis. Ewes apparently do not become infected. The epididymitis is detected by palpation and diagnosis by the complement-fixation test which is reliable.—*Off. Internat. des Epizoot., Sept. 14, 1955.*

Efficacy of Piperazine in Horses

Piperazine adipate (10 Gm./100 lb.) will remove nearly 100 per cent of adult and immature ascarids and adult Trichonema, 80 per cent of adult *Oxyuris equi*, and about 50 to 60 per cent of Triodontophorus spp. and *Strongylus vulgaris* from horses. It apparently has little effect against *Strongylus edentatus, Strongylus equinus,* Habronema spp., or anoplocephalid tapeworms. Piperazine could eliminate ascarids from an entire stable, and is approximately equivalent to phenothiazine in controlling "red worms" but without the risk of toxicity.—*Vet. Rec., Aug. 27, 1955.*

Notifiable Diseases in Britain

From Jan. 1 to July 15, 1955, confirmed outbreaks of the following diseases were reported in Great Britain: anthrax—461; atrophic rhinitis—1; foot-and-mouth disease—6; fowlpest—344; swine fever—904. Totals for similar periods in the previous three years were reported as: anthrax—915; atrophic rhinitis—3 (all in 1954); foot-and-mouth disease—475 (437 of them in 1952); fowlpest—1,295; and swine fever—3,294 (1,826 in 1953).—*Vet. Rec., Aug. 13, 1955.*

Use of a Higher Streptomycin Level in Semen from a Bull of Low Fertility

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A number of artificial breeding studs have at some time encountered individual bulls with a breeding efficiency significantly lower than the stud average. In some cases, thorough examinations have failed to indicate pathological, bacteriological, or other specific causes which might explain this lower efficiency. Since artificial breeding technicians prefer to use semen of high efficiency in order to decrease travel expense for repeat services, the result is frequently a lack of use of a bull with low fertility that might sire calves of more value than those with high efficiency.

In an attempt to improve this low efficiency, experimental work was started with two objectives: (1) to determine if a higher level of dihydrostreptomycin would increase the efficiency of a bull with low fertility which is apparently free from infectious disease, and (2) to observe possible toxic effects upon the sperm from the increased amount of dihydrostreptomycin in view of variable reports by Adler and Rasbech[1] and Almquist *et al.*[2]

Experimental Procedure.—With the cooperation of a local breeding association,* a Jersey sire of low fertility was selected for the trial. Bacteriological and serological examinations had failed to disclose evidence of any infectious agents in this animal. Semen was collected at weekly intervals and was extended with egg yolk-citrate (40:60) with a final dilution between 1:20 and 1:30. The diluent contained 3 mg. of sulfanilamide per milliliter, and penicillin was added to make a concentration of 1,000 units per milliliter. Dihydrostreptomycin was added to half of the extended semen at the rate of 1,000 μg. per milliliter and to the other half at the rate of 2,000 μg. per milliliter. Fourteen technicians who were not aware of the experimental work were formed into two groups in such a manner that expected totals of first services per group would be approximately equal. One group used semen containing 2,000 μg./1 ml. of dihydrostreptomycin and the control group used semen with 1,000 μg./1 ml.

The data reported was collected over a six-month period, at which time this sire was sold because the technicians avoided using his semen.

Results.—Since the technicians knew this sire was of low fertility, they preferred to use semen from other bulls, making it difficult to obtain the desired number of first services.

TABLE I—Comparison of Two Levels of Dihydrostreptomycin in Diluted Semen from a Bull with Low Fertility

Experimental			Control		
	2,000 μg./ml.			1,000 μg./ml.	
Technician	First services	Returns	Technician	First services	Returns
A	22	8	H	40	19
B	11	6	I	16	5
C	22	15	J	19	9
D	19	6	K	34	17
E	11	6	L	3	0
F	2	0	M	8	4
G	7	4	N	4	1
Total	94	45		124	55
60 to 90 day nonreturn		52.12%			55.65%

Analysis of the data with the *chi*-square test indicated no statistical difference between the experimental and control groups. There was no significant variation between the results of the two groups of seven technicians, nor between individual technicians, with the exception of technician C whose variation was doubtless due to some other cause than the preparation used.

Summary.—By means of the split-sample technique, diluted semen from a sire of low fertility, which was apparently free from infectious disease, was treated with an experimental level of 2,000 μg. per milliliter of dihydrostreptomycin, with the control group receiving 1,000 μg./1 ml. Fourteen technicians inseminated 218 cows with a 60- to 90-day nonreturn of 52.12 per cent for the experimental group and 55.65 per cent for the control group. Statistical analysis showed no significant variation between the groups regarding breeding efficiency or toxicity.

References

[1]Adler, H. C., and Rasbech, N. O.: Studies on the Effect of Antibiotics on the Fertility of Bull

*Central Vermont Breeding Association, Montpelier.

From the Department of Animal Pathology, University of Vermont and State Agricultural College, Burlington.

Vermont Agricultural Experiment Station journal series paper 54.

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The authors thank Dr. W. R. Adams, chairman of the Department of Forestry, for statistical analysis of the data. Acknowledgement is also given to A. J. LaCasse for technical assistance.

Semen. III. Comparison of 1,000 and 5,000 μg. of Dihydrostreptomycin per Milliter of Diluent with Special Reference to the Use of Semen from *Vibrio Fetus*-Transmitting Bulls. Nord. vet.-med. (March, 1953): 211-220 (abstr. in J.A.V.M.A., *123*, (1953): 248).

[2]Almquist, J. O., Glantz, P. J., and Thorp, W. T. S.: The Effect of Streptomycin upon the Livability and Bacterial Content of Bovine Semen. J. Dai. Sci., *31*, (1948): 501-507.

"Lacombe," a New Breed of Swine.—A new breed of swine called "Lacombe" has been developed by combining the Landrace, Chester White, and Berkshire breeds at the experiment station of the Canadian Department of Agriculture.—*Prairie Farmer, Sept. 17, 1955.*

Inbreeding Versus Linebreeding.—Inbreeding, the mating of closely related animals, places no special emphasis on the relationship to an individual animal, whereas linebreeding is the breeding of one parent to his or her offspring; for instance, a sire to his daughters, granddaughters, great granddaughters, and so forth.—*Aberdeen Angus J., Oct., 1955.*

A 3-year-old, first-calf heifer with her 3 calves, a probable case of superfetation, submitted by Dr. A. F. Wempe, of Marysville, Kan., after seeing the photograph in the JOURNAL (Oct., 1955, p. 313) of a cow and her 2 calves born three weeks apart. The light-colored pair of calves was born March 27, 1944. The black calf was delivered by Dr. Wempe, 22 days later. The twins were sired by a Shorthorn bull, the black calf probably by a neighbor's Aberdeen Angus bull. All lived to maturity.

Congenital Atresia Ani and Recti in a Calf

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A 2-month-old native male calf was brought to the hospital of the College of Veterinary Medicine, University of the Philippines, on July 14, 1955, because of a congenital malformation. The owner had noticed the absence of an anus and, three weeks before the calf was brought to the clinic, had punctured the rectum and feces was expelled. However, the wound healed and defecation had not occurred for two weeks.

The skin of the perineal region was not distended, and the wound made by the owner was ventral to where the anus should be. The external genital organs were normal. There was considerable straining, tympany, depression, and no inclination to suck. The pulse rate was 80; respiration, 30; and temperature, 102.2 F.

The calf was restrained in lateral recumbency on an operating table, the region was swabbed with tincture of iodine then decolorized with ethyl alcohol, and 10 cc. of 2 per cent procaine hydrochloride solution was injected intradermally around the anal region. A circular piece of skin corresponding to the normal size of the anus was excised. By blunt dissection, the cordlike ampulla of the rectum was located in the pelvis about 1½ inches from the perineum. The gut was carefully dissected from its attachment, drawn backward, and held by noncrushing forceps. When a circular piece was excised from its blind extremity, a fetid gas and black feces were expelled to a distance of about 2 meters and immediate relief was noticed. The lumen of the rectum was packed with cotton to minimize smearing of the wound with feces, the wound was cleaned with a weak solution of potassium permanganate, and the rectal mucosa was sutured to the cutaneous margin of the circular aperture corresponding to the anus, with several interrupted silk sutures. Capillary hemorrhage stopped as soon as the approxima-

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tion was completed. The cotton pack was then removed, sulfanilamide powder dusted on the wound, tetanus antitoxin injected subcutaneously, and 800,000 units of dicrysticin* was given intramuscularly. The latter injection was repeated in 24 hours.

The sutures were removed on the seventh day. While the anus was partially relaxed because part of the sphincter muscles had been excised, the frequency and manner of defecation was almost normal. The calf recovered satisfactorily one week after the operation.

*Dicrysticin is a product of E. R. Squibb and Sons, New York, N. Y.

Leptospira Causes Abortion in Swine

When 4 sows were inoculated with *Leptospira pomona* during their third month of pregnancy, they aborted 37 pigs, 34 of which were dead or dying. Focal necrosis of the liver was found in 14 pigs and Leptospira organisms were isolated from 12. The sows began excreting the organism in their urine nine to 17 days after inoculation, then continued to do so for five to 83 days. For diagnosis, the organisms may be found in the peritoneal fluid which should be inoculated into guinea pigs.—*Vet. Bull., Sept., 1955.*

Crossbred Dairy Cows.—Crossbreeding, long profitable in swine-raising, is increasing in dairy husbandry. Research at two experiment stations indicates that crossbred cows have an advantage of 18 to 25 per cent in milk production over purebred cows.—*Successful Farming, Oct., 1955.*

Cystic Ovaries in Cows

In 352 cows with cystic ovaries, both ovaries were affected in 43.8 per cent. In 265 cows with known histories, 73.6 per cent showed nymphomania and 26.4 per cent failed to show estrus. Of 146 treated with sheep pituitary gonadotropin (vetrophin), 84.9 per cent recovered and 71.2 per cent conceived. Of 127 given 2,500 to 5,000 I.U. of chorionic gonadotropin (follutein) intravenously, 83.5 per cent recovered and 75.6 per cent conceived. Results were slightly better when the cysts were not manually removed before treatment. Cows that either failed to respond or relapsed after treatment usually responded to retreatment, with some evidence that the hormone preparation used should be from a different source than the original one.—*S. J. Roberts in Cornell Vet., Oct., 1955.*

Dairy Breed Peculiarities

The first sign of estrus may occur in the smaller dairy breeds at 6 months of age but sometimes in the larger breeds it may not occur until 12 months. For best results it is suggested that Jersey heifers not be bred before 15 months of age, Holstein-Friesians before 18 months, and Brown Swiss before 21 months. The average gestation period also seems to vary with size from a 280-day average for Jerseys to a 287-day average for Brown Swiss.—*Hoard's Dairyman, Oct. 10, 1955.*

[A limited survey made years ago indicated that the Brown Swiss also varied from other breeds in teething age, their permanent incisors erupting at a considerably later date.—W.A.A.]

Artificial Insemination in Swine.—Of 289 sows and gilts artificially inseminated from a stud of 4 Large White boars in Britain, 4 had farrowed litters of 13, 9, 8, and 11, an average of just over 10.—*Vet. Rec., Sept. 10, 1955.*

Pregnancy Toxemia of Sheep

When pregnancy toxemia was induced in 31 ewes in Australian experiments, recovery occurred in 6 of 8 treated with 120 ml. of glycerol in water daily by stomach tube, and in 6 of 8 given 100 ml. of 60 per cent glucose subcutaneously twice daily. Of the 13 untreated controls only 2 recovered. Continued or recurring hypoglycemia eventually results in irreversible encephalopathic changes. Therefore, affected animals must be located and treated as early as possible.—*Austral. Vet. J., July, 1955.*

Semen Fertile After Two-Year Freeze.—Semen samples from 2 bulls, diluted at the rate of 1:40 in whole milk diluent, glycerinated to a final glycerol concentration of 10 per cent by volume, and frozen and stored for two years, have been proved to be fertile.—*Canad. J. Comp. Med., Sept., 1955.*

Clinical Data

"Muzzle Disease"

A Clinical Entity in Cattle in Southeastern Pennsylvania and Delaware

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A CLINICAL ENTITY of cattle which we have designated tentatively as "muzzle disease" was first seen in the southeastern Pennsylvania-Delaware area during late July, 1955, in Newcastle County, Delaware. Since that time, several hundred cases have been reported to our clinic by practicing veterinarians throughout this six-county area (Bucks, Chester, Delaware, Montgomery Counties, Pa., and Newcastle County, Del.) The disease occurs at all ages in all breeds and types of cattle. The morbidity, on the basis of clinical symptoms, is usually less than 10 per cent. Up to the present time, only 4 fatal cases have been reported. It has been diagnosed by practitioners as mycotic stomatitis, mucosal disease, possible plant poisoning, and allergic sensitization.

SYMPTOMATOLOGY

Observations made in one herd of Hereford cattle indicated that temperature elevations up to 106 F. for 24 to 48 hours occurred before clinical signs were noted. Some cattle with elevated temperatures in this herd failed to develop visible clinical signs. Following the initial rise in temperature, a profuse mucous discharge from the nose and stringy salivation occurred. Respirations were labored and some animals coughed. As the disease progressed, there was cyanosis and edema of the lips in every case. Erosions appeared on the muzzle. In severe cases, erosions also appeared on the tongue (both dorsal and ventral areas), on the dental pads, gums, and hard palate. A constant lameness resembling laminitis was noted. There was cyanosis and edema of the coronary region with exfoliation of the interdigital tissue. Lesions on the udder and teats, which appeared as severe hyperemias and as erosions, were confined to the lateral surfaces. The mammary manifestations resembled allergic reactions. In animals with severe cases, incrustations were noted on the skin over most of the body, particularly on the head and legs. These resulted from the drying of serum in small superficial hemorrhages.

Hematological findings have been within normal limits except in animals with extensive mucopurulent discharges. In such animals, there was leukocytosis with an excess of neutrophils.

Treatments used by clinicians who have seen this syndrome include antibiotics, antihistamines, iodides, both intravenously and orally, and sulfonamides. Some animals have made spontaneous recoveries in seven to ten days without any treatment.

Diarrhea was an infrequent sign but was seen in the animals that died.

NECROPSY FINDINGS

Necropsy findings were essentially those of erosion and hemorrhage of the mucous membranes throughout the alimentary tract. Erosions of the muzzle, gums, dental pads, palate, and esophagus were constant. Erosions of the rumen, in the limited number necropsied, were confined to the area near the esophageal groove. The abomasum showed inflammation with petechial hemorrhages, erosions, and ulcer formation in the pyloric area. Erosions and submucosal hemorrhages were scattered throughout the small intestine. The most severe lesions were found in the cecum and first part of the colon. Here hemorrhages, erosions, and ulcers were numerous, especially in the cecum around the ileocecal valve. Lesions of the large intestine were similar to those found on the small intestine but were more consistent and more severe. Proctitis was not present. The gallbladder sometimes had striated hemorrhages, and thick bile was present.

Histopathological examinations of tissue sections are being made. Table 1 compares the "muzzle disease" here described with other diseases of a similar nature.

ETIOLOGY AND TRANSMISSION

Suspensions of liver, spleen, nasal washings, and muzzle erosions from terminal

From the Department of Medicine (Hollister, Arnold) and the Department of Preventive Medicine (Fagan), School of Veterinary Medicine, University of Pennsylvania, New Bolton Center, Kennett Square.

cases were used in trials to transmit the disease to 3 young calves, without success. The intravenous injection of serum taken from an animal at the height of its febrile period failed to reproduce any part of the syndrome in a 2-month-old calf. Injections of the antibiotic-treated materials failed to infect mice, guinea pigs, and chicken embryos.

Bacteriological examinations of muzzle lesions, nasal washings, blood, milk, and urine failed to reveal any consistent agent, nor did serological examinations reveal any evidence of foot-and-mouth disease or vesicular stomatitis.

DISCUSSION

The consensus among practicing veterinarians in the six-county area under consideration is that this syndrome represents a new disease. However, one of the veterinarians who has been in practice in this area for more than 30 years claims that he observed this syndrome in the early days of his practice and he called it "mycotic stomatitis." Dr. W. R. Pritchard of Purdue University, when he visited the clinic at the University of Pennsylvania in October, 1955, and was shown 1 of the affected animals, said that if he saw a cow with this same condition in southern Indiana he would call it "mycotic stomatitis."

Whether this syndrome represents a new disease or an old one is an academic question that is difficult to settle. Accurate descriptions and records of current cases, as well as those of 30 years ago, are not readily available. More important is the problem of infectivity. This problem brings to mind the history of hyperkeratosis. Until the agents involved in hyperkeratosis were revealed, many etiological theories, including infectivity, were proposed. In the present problem, the use of techniques successful in isolating the agents of Indiana and New York virus diarrhea have failed to reveal an agent. Although such negative results may be discouraging, they should not be taken as ruling out an infectious agent. In addition, toxic agents in plants or agents used in agriculture practice may be involved as etiological factors in the disease.

Since no etiological agent has been isolated, it is difficult to demonstrate that all these cases are the same entity. Anatomical lesions are certainly similar in all cases. Investigations will have to continue until the nature of this syndrome is elucidated.

SUMMARY

A disease in cattle in Pennsylvania and Delaware has been described. Its etiology and mode of transmission are unkown. The manifestations of this disease differ from the mucosal diseases[1-5] reported,

TABLE I—Bovine Diseases with Mucosal Erosions*

	Mycotic stomatitis[1]	Mucosal disease[2]	Virus diarrhea Indiana[3]	Virus diarrhea New York[4]	"Muzzle" disease[5]
Incubation exposure	Unknown	2-8 days	2-5 days	6-7 days	Unknown
High temperature	No	Yes, 2-3 days	Yes	Yes	Yes
Leukopenia	?	Yes	Yes	Yes	No
Rhinitis	No	Yes	Yes	Yes	Yes
Lacrimation	No	Yes	No	Yes	Inconstant
Diarrhea	Yes	Yes	Yes	Yes	No, only in severe cases
Buccal erosions	Yes	Yes	Yes	Yes	Yes
Erosions on dorsum tongue	No	Yes	No	No	Yes
Inflamed hemorrhagic erosion in digestive tract	Yes	Yes	Yes	Yes	Yes
Lymphoid tissue damage	?	Yes	Yes, mild	Yes	?
Corneal opacity	No	Yes, 10%	Rare, calves	No	No
Lameness	Yes	Yes, 10%	Yes, 10%	No	Yes
Morbidity (field)	10.0%	2-50%	80-100%	33-88%	2-20%
Mortality	0.5%	90% clinical cases	4-20%	4-8%	Very low
Transmissible agent	?	Yes	Yes	Yes	No
Immune animals	?	Yes	Yes, 4 mo.	Yes	?
Immune serum	?	?	?	No	?
Neutralization test	?	?	?	?	?

*Modified from a chart presented by Col. F. D. Maurer at a veterinary meeting at New Bolton Center, Pa., on Oct. 4, 1955.

[1]Hutyra, Marek, Manninger, 5th ed. A. Eger, Chicago, 1946; [2]F. K. Ramsey, Iowa, W. R. Pritchard, Purdue; [3]W. R. Pritchard, Purdue; [4]C. J. York, Pitman-Moore Co., Indianapolis, Ind., K. McEntee, Cornell University, Ithaca, N. Y.

particularly in the morbidity, mortality, and seasonal prevalence, as well as the absence of diarrhea. The presence of udder, teat, and foot lesions in this syndrome is not found in descriptions of mucosal disease. Animals with severe infection also have incrustations of the skin over much of the body.

References

[1]Pritchard, W. R.: Proc., Conference on Mucosal Disease, Purdue University, February 1955.

[2]Olafson, P., MacCallum, A.D., and Fox, F. H.: An Apparently New Transmissible Disease of Cattle. Cornell Vet., *36*, (April, 1946) 205-213.

[3]MacEntee, K.: Proc., Conference on Mucosal Diseases, Purdue University, February, 1955.

[4]Ramsey, F. K., and Chivers, W. H.: Mucosal Disease of Cattle. North Am. Vet., *34*, (Sept., 1953): 629-633.

[5]Schipper, M. S., Eveleth, D. F., Shumard, R. F., and Richards, S. H.: Mucosal Disease of Cattle. Vet. Med., *50*, (Oct., 1955): 431-434.

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Comment.—Reference in the above article to the presence 30 years ago of a similar disease suggests that the following reports on affected animals seen in northwest Iowa in 1932 might be of interest.

Case 1.—On August 26, a pregnant Hereford heifer, 2 years old, was seen on her third day of illness. Her symptoms were stiffness, a temperature of 104 F., "pink" conjunctiva, purplish red muzzle, mucopurulent nasal discharge, drooling and smacking of lips (like symptoms of foot-and-mouth disease), mouth stiff, bluish oral mucosa but no vesicles, necrosis over the dental pad but no lesions on feet or teats. She aborted six days later. On September 8, still weak and with uterine discharge, the heifer began to eat. She recovered slowly.

Case 2.—On September 5, a 6-month-old beef calf in a separate pasture on the same farm was found to have a dry, cracked muzzle, necrosis of the border of the lips and dental pad, purplish congested coronets, and interdigital ulcers. On September 8, the calf still was not eating but lip and foot lesions were improving.

Case 3.—On September 1, a yearling Hereford heifer in a pasture 2 miles from cases 1 and 2 was lying apart from the herd. She was stiff, with a temperature of 102.8 F.. rumen sluggish, feces were semiliquid, the forefeet sensitive, and the muzzle dry, brown, and cracked. There was also necrosis of the lips, dental pad, and oral mucosa adjacent to the incisors. She recovered in a few days.

Case 4.—On September 3, on a farm between the two previously mentioned, a young Guernsey cow was reported to have developed a stomatitis and "sore" teats; she walked slowly. When first examined on September 8, she was eating well but her feet were still sore and her teats were pealing.

Because of the drought conditions and since only 1 animal was affected in each pasture group, infection was not suspected. No similar cases were seen in that practice in the following 20 years.—W.A.A.

A Bot in an Equine Ovary

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On May 7, 1954, a Thoroughbred mare was presented to the departmental diagnostic laboratory (Kentucky Agricultural Experiment Station) for necropsy. The mare had been confined to a stall for ten days with a sick foal before becoming sick and going off feed on the afternoon of May 5. Her temperature was 104 F. the afternoon before death at 8:00 a.m. on May 7.

At necropsy, the lungs contained numerous areas of suffusion hemorrhage, and hemorrhages were generalized on the serous membranes of the thoracic cavity, being most extensive in the area of the aorta. Severe gastritis and enteritis were present and there was considerable sloughing of the mucous membranes of the duodenum and jejunum. The left ovary contained a large cyst (3.0 cm.) in which a bot was found. Death was ascribed to septicemia.

The bot was a living, third instar of *Gasterophilus intestinalis.** The authors were unable to find any previous record of this parasite in the ovary. *Gastrophilus intestinalis* has, however, been recovered

From the Department of Animal Pathology, Kentucky Agricultural Experiment Station, Lexington.

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*The authors are indebted to Drs. Allen McIntosh and E. W. Price of the Animal Disease and Parasite Research Branch, ARS, U. S. Department of Agriculture, for verifying the identification of the specimen which has been catalogued as U.S.N.M. Helm. Coll. No. 45938.

Fig. 1—The affected ovary of the mare opened to show the bot and the hemorrhagic area about it. The ovary also contained many pockets formed by fibrinous material.

from the nasal sinuses,[4] brain,[1] and peritoneal cavity.[3] Additional reports of bots, botfly larvae, and grubs in aberrant locations include the brain,[5,8] bile duct,[2] and peritoneal cavity.[6,7,9] The most common abnormal location appears to be the peritoneal cavity; however, in each report this was associated with a rupture of the stomach or intestine.

When the affected ovary was cut sagittally and laid open bookwise (fig. 1), the area about the bot was seen to be hemorrhagic and contained many pockets formed by fibrinous material. There was no opening between the cyst and the surface of the ovary. No ruptures or perforations were found in the stomach and intestines. The stomach was then opened and found to contain only a moderate infection of bots (99 *Gasterophilus nasalis;* 124 *G. intestinalis*).

The authors are unable to suggest the route of infection or the ultimate fate of this abnormally located parasite.

References

[1]Baumann, R., and Böhm, L. K.: Cysticercose des Lendenmarkes beim Hunde. Wien. Tierärtztl. Monatschr., *28,* (1941): 7-14.

[2]Bonnikson, H. P.: Bile and Uremic Poisoning in a Mare Due to Larvae of *Gasterophilus Equi.* Cornell Vet., *6,* (1916): 218-220.

[3]Drudge, J. H., Leland, S. E., Jr., and Behlow, R. F.: Unpublished records.

[4]Fantin, O.: Sintomi cerebrali in un cavallo prodotti dolle larvae d'estro. Clin. Vet., Milano, *30,* (1907): 491-492.

[5]Hutyra, F., Marek, J., and Manninger, R.: Pathology and Therapeutics of the Diseases of Domestic Animals. Vol. 3. 4th English ed. Alexander Eger, Chicago, 1938.

[6]Lockhart, A. A.: Bots—Perforation of the Duodenum—Death. Am. Vet. Rev. (N. Y.), *47,* (1915): 476-477.

[7]Ozarzum, G. R.: Peritonitis consecutiva a la perforacion del segmento inicial del duodeno producida por gastrofilos. Rev. Med. vet. y Parasitol., Caracas, *1,* (1939): 196-197.

[8]Rose, J.: An Account of a Grub in the Cerebellum of a Horse. Veterinarian, London, *15,* (1842): 327.

[9]Underwood, P. C., and Dikmans, G.: Gastralgia in a Horse Due to Bot Infestation. Vet. Med., *38,* (1943): 12-13.

A Partial Fourteenth Rib in the Ox

A crossbred male dairy calf weighing about 300 lb. had, bilaterally, a fourteenth rib consisting of three parts connected by fibrous tissue. The dorsal part was 4 inches long and had a typical vertebral extremity. The middle part, about 3 inches long, was partly cartilaginous. The ventral extremity was short, only partially ossified, and carried a typical costal cartilage. The usual six lumbar vertebrae were present.—*W. M. McLeod, D.V.M., Department of Anatomy, School of Veterinary Medicine, Kansas State College, Manhattan.*

Activity of Piperazine *in Vitro*

Living *Ascaris lumbricoides* recovered from swine when slaughtered and placed in solutions containing piperazine base in dilutions of 1:200 to 1:560 caused no increased activity of the worms due to irritation. It reduced their activity after five to six hours with complete narcosis in 24 hours. When removed to a solution free of the drug, the ascarids recovered full activity in 30 minutes to two hours. The lack of increased activity is considered a desirable feature since it may preclude occlusion of the bowel or of the common bile duct as a result of the efforts of the parasite to escape.—*Brit. M. J., July 2, 1955.*

Piperazine as a Vermifuge.—A group of chemicals called "piperazine compound" are effective, safe, and convenient for controlling a wide variety of internal parasites in swine, according to Dr. A. C. Todd, University of Wisconsin. It should be administered one day in every two months in a mixture of dry or wet feed, in a capsule or as a liquid suspension. The compound can be given to pregnant sows close to farrowing.—*Univ. of Wisconsin Release, Aug. 16, 1955.*

Toxoplasmosis in Canada

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THE PURPOSE of this report is to review briefly the clinical, pathological, and epidemiological aspects of toxoplasmosis, the incidence of which is apparently increasing, and to report naturally occurring cases in four species of animals in Canada. These include one case in a mink, a species in which toxoplasmosis has not been reported previously.

BRIEF REVIEW OF THE LITERATURE

The identity of the causal agent of toxoplasmosis is a subject of some controversy. Cross[12] feels that her studies support the theory of its being a protozoan, while Manwell and Drobeck[24] conclude that it is probably more closely related to Sarcocystis—therefore, probably a yeast.

In paraffin sections, the organism varies in size from 1.4 to 1.8 μ wide, by 1.4 to 3.6 μ long.[22] In peritoneal exudate, they may be 5.7 μ or more in length and are usually crescent shaped. When they appear in sections, they are round and are either (*a*) free, (*b*) in cells of the reticuloendothelial system, leukocytes, or parenchymatous cells of various organs, or (*c*) in pseudocysts (terminal colonies).[34,41]

Distribution of Toxoplasma sp. appears to be world-wide. Natural infections have been reported in 21 mammalian and 45 bird species, although the occurrence in some of the latter may be questionable.[6,22,26,27] Proof that only one species of the parasite *(Toxoplasma gondii)* exists is found in serological tests and in the ease with which it can be transferred from species to species of birds and mammals.[42] In domestic and fur-bearing animals, naturally occurring infection has been reported in dogs, cats, chinchillas, rabbits, swine, cattle, sheep, goats, rats, and mice.[7,16,17,22,32,37]

In attempting to establish the frequency of this disease, workers have used the Sabin-Feldman cytoplasm modifying test to reveal immune antibody titers. The basis of this test is the loss of stain affinity of Toxoplasma cytoplasm in the presence of immune antibody.[42]

In human populations in the United States, significant titers (1:16) have been found in 5 per cent of children under 4 years of age. This figure increased proportionally until at 50 years significant titers were present in 65 to 70 per cent.[3] Surveys in other countries tend to indicate similar findings. Otten and Westphal,[29] in a survey of animal handlers, conclude that infection, clinical and subclinical, is to some extent an occupational hazard since five of six practitioners in canine medicine, and seven of ten assistants, had significant titers. This proved to be a considerably higher proportion than in the general population of that area.

Recently, Cole *et al.*[7,8,40] made surveys in Ohio of human and canine patients with toxoplasmosis. They concluded that the relationship of infection in these species was more than coincidental.

In the animal populations, Miller and Feldman[28] found antibodies against Toxoplasma in the following: 37 per cent of 73 swine, 34 per cent of 44 cats, 48 per cent of 25 goats, 59 per cent of 51 dogs, and 51 per cent of 76 cattle. In cattle, the reaction levels were significantly lower than in the other species. In view of the broad distribution, it has been concluded that the usual host-parasite relationship is a symbiosis in which only exceptional cases become clinically diseased. Contributory to such exceptions might be: (*a*) prolonged contact; (*b*) unusual route of infection, e.g., by way of a wound; (*c*) lowered resistance of the host due to other disease processes; and (*d*) massive infection in a host which has not had the opportunity to acquire resistance, e.g., intrauterine fetal infection.

PATHOGENESIS

Toxoplasma gondii is an obligate intracellular parasite with an apparent ultimate predilection for the brain.[40,44] Enroute to this tissue, however, it usually produces foci of necrosis throughout the viscera and many cases end fatally at this stage.

The route of infection in animals is uncertain except in cases of prenatal transmission.[11,15,25] Lesions suggest entry by the gastrointestinal and respiratory tracts but transmission experiments have been variably successful by these routes.[7,21,37] Wound contamination and mechanical transmission of blood-sucking arthropods have also been proposed as methods of spread.[4,30,45,46]

Following entry in a susceptible animal, the parasites multiply in the cells,[12] decreasing in size as they increase in number. Spread is via the blood and lymph vessels[28] or the reticuloendothelial system.[13] Upon reaching other tissues, miliary foci of necrosis, edema, and granulomatous tissue are formed which give rise to the

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The author acknowledges assistance given by Dr. J. D. Schroder in the microscopic diagnosis of the mink, and the clinical departments of the Ontario Veterinary College in making cases available to him.

symptoms. Since no toxin has been demonstrated,[36] Frenkel[23] believes that the necrosis is caused by a hypersensitivity of the host cells which may be apart from immunity. As the disease progresses, an effective immune titer is built up over a period of weeks or months and the parasites are confined to "pseudocysts" which are thought to be the shells of the host cells (fig. 1). At this stage, they are resistant to antibody neutralization and to treatment. Subsequent rupture of the pseudocysts (fig. 2) boosts the immune titer and little further damage is done.[27] However, because of the variable period required to develop immunity, the course of the disease from contact to recovery or death may be several months or it may be as short as four days.[14,43] In addition to cases of direct damage to tissue (often irreparable), 4 cases have been reported in dogs[5,21] in which the parasites in the intestinal tract are believed to have been responsible for potentially fatal intussusception of the bowel.

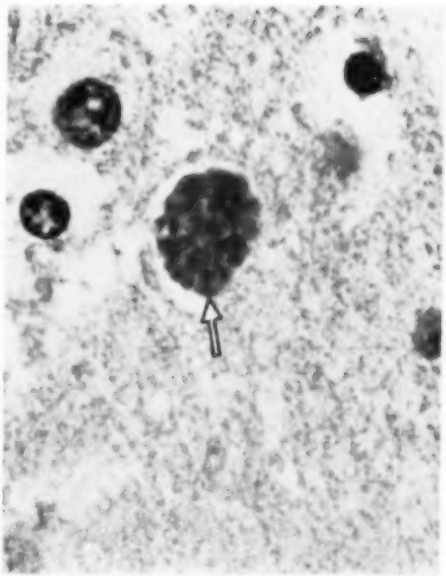

Fig. 1—"Resting" pseudocyst (arrow) in Toxoplasma-infected brain tissue. x 750.

SYMPTOMS

Symptoms of toxoplasmosis are referable to the organs affected and consequently vary with individuals and host species. A group of dogs[7] was found to show (indicated here in descending order of frequency): emaciation, anorexia, depression, weakness, ocular and nasal discharge, pale mucous membranes, cough, vomition, diarrhea, and central nervous system disturbances. The temperature may be 105 F. to 108 F.[14,36]

In cats,[26,32,47] the disease tends to be chronic and thus it appears more often as a wasting disease with encephalitic symptoms. Holzworth,[26] in a review of 6 cases in cats, suggests that ataxia is a significant symptom.

Mature ruminants[43,47] and swine[7,22] exhibit fewer specific symptoms, while young pigs, lambs, and calves infected *in utero* tend to develop encephalitic symptoms before death. One author[47] describes a case in a mature sheep which resembled listeriosis.

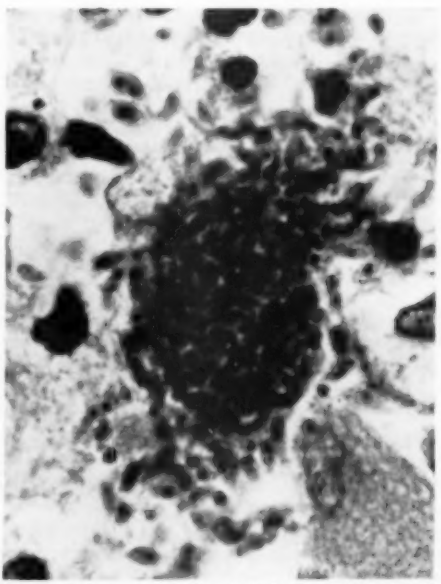

Fig. 2—Rupturing pseudocyst in brain with surrounding inflammatory cells. x 850.

DIAGNOSIS

Clinical diagnosis of toxoplasmosis is difficult as it may resemble many of the common diseases, particularly distemper and infectious hepatitis in the dog. Sero-

logical, microscopic, and animal inoculation tests must be resorted to for confirmation.

Of the diagnostic tests, the intradermal toxoplasmin test is the easiest but the least accurate as it indicates the presence of antibody but does not differentiate subclinical or active infections. There is also some danger of false positive reactions.[3]

The Sabin-Feldman cytoplasm-modifying test of blood serum is more accurate, particularly when a repeat sample shows a rise in titer, but to carry out this test a well-equipped diagnostic laboratory must be available. The complement-fixation test is generally used only to supplement the Sabin-Feldman test as antibodies appear relatively late in the course of the disease. Serum-neutralization tests in rabbits are rarely used.

The relatively simple animal-inoculation procedures, in which white mice are used, depend on the appearance of Toxoplasma organisms in the smears of peritoneal exudate of the test animals. Confirmation for accuracy is accomplished by examination of paraffin sections. Cerebrospinal fluid, blood, pleural and peritoneal exudate, milk, and biopsies of lymph node, tonsil, or viscera have been injected into test mice to confirm clinical cases.[1,7,29]

At necropsy, diagnosis is based on typical microscopic lesions and on animal-inoculation procedures.

TREATMENT

Since Toxoplasma is predominantly an intracellular parasite, problems of treatment are similar to those encountered with viruses. Most therapeutic agents,[10] including antibiotics and those effective against protozoa, show little or no antitoxoplasmic effect. Sulfonamides and sulfones, particularly daraprim (2:4 diamino pyrimidine), are the most active agents and a combination of daraprim and sulfadiazine used experimentally showed a marked synergistic effect.[18,19] Work with these drugs has been confined to laboratory animals.

Satisfactory prophylactic agents have not been developed, though killed suspensions of organisms and nonspecific protein injections may be of some help.[2,24]

Clinicians should keep in mind the possibility of contracting the infection and of transmitting it to other animals, particularly those debilitated by previous diseases.

CASE REPORTS

Dogs.—The age range of 8 dogs with fatal cases of toxoplasmosis, at the Ontario Veterinary College (table 1), was 3 months to 7 years. Six were 1 year of age or less. Upon arrival, their temperatures were 103 F. to 107 F.; 6 showed predominantly pneumonic symptoms; 4 showed encephalitic tremors and incoordination; and 4 evidenced gastrointestinal disturbances with vomiting and diarrhea. All but 1 exhibited anorexia and depression for three to 11 days prior to death. On necropsy, all

TABLE 1—Symptoms and Lesions Observed in Animals with Toxoplasmosis

		Symptoms						Lesions				
Species	Age	Pneumonia	Anorexia	Vomiting	Diarrhea	Encephalitis	Additional	Pneumonic	Hepatic	Splenic	Intestinal	Additional
1 Canine	7 yr.	+	+	+	....	+	Polydipsia	+	+	....	+	*
2 Canine	3 mo.	+	+	....	+	....	Lymphadenitis	+	+	+	*	Kidney
3 Canine	4 mo.	....	+	+	....	+	.....	+	+	+	....	Brain
4 Canine	4 mo.	+	+	+	+	....	.....	+	+	+	....	Kidney, heart
5 Canine	4 mo.	....	....	....	....	+	Dermatitis	+	+	....	....	Heart
6 Canine	6 mo.	+	+	....	....	....	Lymphadenitis	+	+	+	+	Heart, lymph node
7 Canine	3 mo.	+	+	....	....	+	.....	....	....	....	....	Brain (hydrocephalus), distemper inclusions
8 Canine	1 yr.	+	+	....	....	....	.....	+	+	+	....	.....
9 Feline	Aged	....	+	....	+	....	Losing wt. for 4 mo.	*	*	+	+	*
10 Chinchilla ranch 1	1 yr.	+	+	....	....	....	Very short course, ears drooping	+	+	+	+	Lymph nodes
11 Chinchilla ranch 2	2 yr.	+	+	....	....	....	Very short course, ears drooping	+	+	+	+	Lymph nodes
12 Chinchilla ranch 3	?	+	+	....	....	....	Very short course, ears drooping	+	+	+	....	Lymph nodes, kidney
13 Mink	6 wk.	....	....	....	....	....	Fur rough	+	+	*	+	Urinary bladder

*Not sectioned.

8 had lung lesions varying from small, dry, white foci to a diffuse hemorrhagic pneumonia; 5 showed a characteristic mottling of the liver prophetic of the microscopic findings; 3 showed gastrointestinal changes; 2 had cortical streaking on the kidneys; and 2 had a generalized lymphadenitis. The brains of 2 of the 4 dogs with encephalitis showed hemorrhagic streaking in the cerebral cortex; the lateral ventricles of 1 were distended to three times normal size and contained clear, yellow fluid.

Microscopic examination of paraffin sections, stained with hematoxylin and eosin, revealed typical areas of necrosis, edema, and cellular infiltration of the lung and liver in 7 dogs; of the spleen in 5; of the heart in 3; of the kidney in 2; and of the intestine in 2. These areas tended to be filled with predominantly mononuclear cells in the more chronic encephalitic cases, while in the acute cases there were fewer cells but more necrosis and edema. In the acute cases, numerous eosinophilic Toxoplasma organisms with basophilic centers were seen both free and in macrophages, while in the chronic cases few, if any, were apparent although more pseudocysts were visible. Sections of the brains showed pronounced cellular reactions (fig. 3) and contained as many as 10 pseudocysts per high power field. Perivascular hemorrhage was visible in the two brains in which the hemorrhagic streaks had been observed grossly.

Cats.—Tissue samples of 1 aged cat were submitted. The animal had been losing weight for four months, had diarrhea, and did not respond to the usual therapy. Microscopic examination revealed a granulomatous, threefold thickening of the intestinal wall and focal necrosis in an intestinal lymph gland and in the spleen. Toxoplasma organisms, free and in macrophages, were visible in these lesions. As these were the only tissues submitted, it was impossible to determine the extent of the infection.

Chinchillas.—Outbreaks of a disease on three widely separated chinchilla ranches in southern Ontario resulted in submission of animals to the Ontario Veterinary College for diagnosis. The animals showed drooping ears, rough fur, and a hunched posture. Respiratory distress was evident and the abdomen appeared to be distended. The course of the disease in most cases

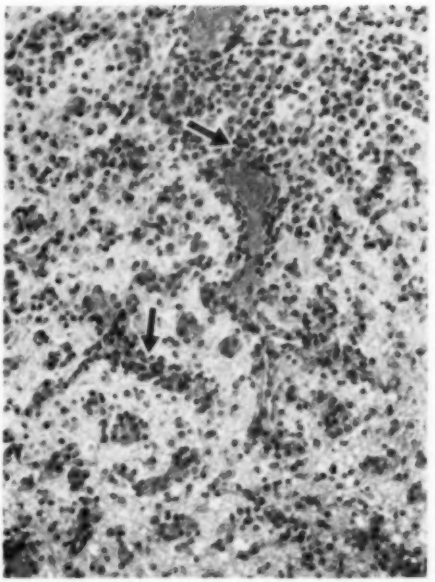

Fig. 3—Encephalitic toxoplasmosis; note the perivascular distribution (arrows). x 86.

was about four to ten hours with nearly all the losses occurring in a period of three days. Mortality on two of these ranches was approximately 50 per cent. No record is available on the third ranch.

Ranch 1.—Necropsy on 2 animals from ranch 1 revealed blood-tinged fluid in the thoracic and abdominal cavities, dark lungs, and enlarged mesenteric lymph nodes. A diagnosis of toxoplasmosis was made on microscopic sections and confirmed by animal inoculation of spleen and liver tissue into white mice.

Ranch 2.—The necropsy findings from 2 animals from ranch 2 were similar to those from the first ranch and a diagnosis of toxoplasmosis was made on microscopic sections and confirmed by animal inoculation of spleen and liver tissue into white mice.

Ranch 3.—One dead and 2 live chinchillas were submitted from ranch 3. Since on necropsy the first animal showed typical lesions of toxoplasmosis, fluid was withdrawn from the thorax of the second animal, smeared on a glass slide, and stained with Wright's blood stain. A positive diagnosis was made on the presence of the free, crescentic parasites, later confirmed

by killing the 2 live animals for animal inoculation and tissue sectioning. Both were positive on both procedures.

A review of the feeding and housing conditions on these ranches failed to reveal a source of infection, though it is possible that it may have been introduced by wild rodents or birds as Keagy[21] suggests.

Mink.—Formolized tissue samples of a 6-week-old mink were submitted. The practitioner reported that the fur of the animal was rough and that on necropsy the liver was an orange-yellow and the spleen was enlarged. Examination of tissue sections revealed fatty degeneration and inflammatory cell infiltration of the liver. Small, spherical bodies, both free and in macrophages, were recognized as Toxoplasma. Lung changes were congestion and mononuclear cell infiltration, with many Toxoplasma organisms present. The urinary bladder and tunica propria of the intestine also contained numerous infective bodies and showed catarrhal cystitis and enteritis.

DISCUSSION

Since animals have been incriminated in Toxoplasma infections in man, at least circumstantially, and since practically all animals are known to contract the disease, a public health hazard exists.

Potential sources of contamination are many since the parasite has been seen in saliva and salivary glands, tonsils, exudates of the lungs, blood, the intestinal wall and free in the intestine, milk, and placental fluids and tissues.[5,7] Meat-producing animals have shown Toxoplasma organisms in the heart, skeletal muscle, and liver.

Since recognition of this disease seems to be on the increase in Canadian animals, transmission to man should be guarded against.

SUMMARY

1) Fatal cases of toxoplasmosis have been seen in 8 dogs, 1 cat, 1 mink, and in three outbreaks on chinchilla ranches. Apparently the infection in all these animals was contracted in Ontario.

2) Toxoplasmosis was diagnosed in the mink on the basis of histopathological findings. This species had not previously been reported as contracting the disease.

3) A review of the pertinent literature is made.

References

[1]Armstrong, C., and MacMurray, F. G.: Toxoplasma Found by Recovery of *T. Gondii* from an Excised Axillary Gland. J.Am.M.A., *151*, (1953): 1103-1104.

[2]Blanc, G., and Bruneau, J.: Préparation d'un Sérum Animal Neutralisant le Virus de la Toxoplasmose. Bull. Acad. de Med., Paris, *134*, (1950): 240-244.

[3]Beverly, J. K. A., Beattie, C. P., and Roseman, C.: Human Toxoplasma Infection. J. Hyg., *52*, (1954): 37-44.

[4]Beverly, J. K. A., Skipper, E., and Marshal, S. C.: Acquired Toxoplasmosis. Brit. M. J., (1955): 577-578.

[5]Bonser, G. M.: Fatal Intussusception of Canine Caecum. Associated with Presence of Toxoplasmas in Circular Muscle of Ileum. J. Path. and Bact., *62*, (1950): 650-653.

[6]Borg, K.: Toxoplasmosis in Hares and Capercaillie in Sweden During the Years 1948-1952. Proc. 15th Internat. Vet. Cong., *2*, Part 1, (1953): 406-408.

[7]Cole, C. R., Docton, F. L., Chamberlain, D. M., Sanger, V. L., Prior, J. A., and Farrell, R. L.: Toxoplasmosis in Domestic Animals. Proc. 15th Internat. Vet. Cong., *2*, Part 1, (1953): 401-406.

[8]Cole, C. R., Prior, J. A., Docton, F. L., Chamberlain, D. M., and Saslaw, S.: Toxoplasmosis. III. Study of Families Exposed to Their Toxoplasma-Infected Pets. Arch. Int. Med., *92*, (1953): 308-313.

[9]Cole, C. R., Sanger, V. L., Farrell, R. L., and Kornder, J. D.: The Present Status of Toxoplasmosis in Veterinary Medicine. North Am. Vet., *35*, (1954): 265-269.

[10]Crema, A., and Ambreck, A.: Action of Aureomycin, Terramycin, Tyrothrycin and Non-Specific Protein Therapy in Toxoplasmosis in Rats (abstr. in Vet. Bull., (1954): 426).

[11]Chamberlain, D. M., Docton, F. L., and Cole, C. R.: Toxoplasmosis. II. Intra-Uterine Infection in Dogs. Premature Birth and Presence of Organisms in Milk. Proc. Soc. Exptl. Biol. and Med., *82*, (1953): 198-200.

[12]Cross, J. B.: Cytologic Study of Toxoplasma with Special Reference to Its Effects on the Host's Cell. J. Infect. Dis., *90*, (1947): 278-296.

[13]Cross, J. B., and Anigstein, L.: The Inflammatory Reaction to Toxoplasma in the Omentum and Peritoneal Fluid of the Mouse. Am. J. Trop. Med., *29*, (1949): 473-479.

[14]Cohrs, P.: Early Stages of Encephalitic Toxoplasmosis in Animals. Deutsche Ztschr. f. Nervenh. Bd., *68*, (1952): 227-236.

[15]Cowan, D., and Wolf, A.: Experimental Congenital Toxoplasmosis. IV (abstr. in Vet. Bull., *23*, (1950): 142).

[16]Eyles, D. E.: Toxoplasmosis in the Norway Rat. J. Parasitol., *38*, (1952): 226-229.

[17]Eyles, D. E.: Serologic Response of White Rats to Toxoplasma Infections. J. Parasitol., *40*, (1940): 77-82.

[18]Eyles, D. R.: The Present Status of the Chemotherapy of Toxoplasmosis. Am. J. Trop. Med. and Hyg., *2*, (1953): 429-443.

[19]Eyles, D. E., and Coleman, N.: Synergistic Effect of Sulphadiazine and Daraprim Against Experimental Toxoplasmosis in the Mouse. Antibiot. and Chemother., *3*, (1953): 483-490.

[20]Eyles, D. E., and Coleman, N.: The Relative Activity of Common Sulphonamides Against Experimental Toxoplasmosis in the Mouse. Am. J. Trop. Med. and Hyg., *2,* (1953): 54-63.

[21]Feldman, H. A.: The Clinical Manifestations and Laboratory Diagnosis of Toxoplasmosis. Am. J. Trop. Med. and Hyg., *2,* (1953): 420-427.

[22]Farrell, R. L., Docton, F. L., Chamberlain, D. M., and Cole, C. R.: Toxoplasma. I. Toxoplasma Isolated from Swine. Am. J. Vet. Res., *13,* (1952): 181-185.

[23]Frenkel, J. K.: Host, Strain and Treatment Variation as Factors in Pathogenesis of Toxoplasmosis. Am. J. Trop. Med. and Hyg., *2,* (1953): 390-409.

[24]Frenkel, J. K., and Friedlander, S.: Toxoplasmosis. Public Health Service, U. S. A., Washington, 1953.

[25]Hellbrügge, T. F., Dahme, E., and Hellbrügge, F. K.: Trans-Placental Toxoplasma Infection in Rats. Ztschr. tropenmed u. Parasitol., *4,* (1953): 312-322.

[26]Holzworth, J.: Encephalitic Toxoplasmosis in a Cat. J.A.V.M.A., *124,* (1954): 313-316.

[27]Jacobs, L.: The Biology of Toxoplasma. Am. J. Med. and Hyg., *2,* (1953): 365-385.

[28]Jacobs, L., Melton, M. L., and Cook, M. K.: Experimental Toxoplasmosis in Pigeons. Exptl. Parasitol., *2,* (1953): 403-416.

[29]Kass, E. H., Andrus, N. S., Turner, F. C., and Feldman, H. A.: Toxoplasmosis in the Human Adult. Am. M. A. Arch. Int. Med., *5,* (1952): 759-782.

[30]Kunert, H., and Schmidtke, L.: Zur Unertragung von *Toxoplasma gondii* durch Fliegen (abstr. in Vet. Bull., (1953): 119.)

[31]Keagy, H. F.: Toxoplasma in the Chinchilla. J.A.V.M.A., *15,* (1949): 15.

[32]Lieberman, L.: Intestinal Toxoplasmosis in a Cat. North Am. Vet., *36,* (1954): 43-45.

[33]Miller, L. T., and Feldman, H. A.: Incidence of Antibodies for Toxoplasmosis Among Animal Species. J. Infect. Dis., *92,* (1953): 118-120.

[34]Manwell, R. D., and Drobeck, H. P.: The Behaviour of Toxoplasmosis with Notes on Its Taxonomic Status. J. Parasitol., *39,* (1953): 577-584.

[35]Moller, T.: A Fatal Case of Toxoplasmosis in a Dog (abstr. in Vet Bull., *22,* (1951): 318).

[36]Moulton, J. E., and Linton, G. A.: A Case of Toxoplasmosis in a Dog. Cornell Vet., *43,* (1953): 445.

[37]Olafson, P., and Monlux, M. S.: Toxoplasma Infections in Animals. Cornell Vet., *32,* (1952): 176-190.

[38]Otten, E., and Westphal, A.: Toxoplasmosis in Dogs. Mistaken for Breakdown of Immunity Following Vaccination Against Distemper (abstr. in Vet. Bull., *22,* (1952): 245).

[39]Otten, E., and Westphal, A.: Toxoplasmosis — An Occupational Disease (abstr. in Vet. Bull., *22,* (1952): 318).

[40]Prior, J. A., Cole, C. R., Docton, F. L., Saslow, S., and Chamberlain, D. M.: Toxoplasmosis. IV. Report of Three Cases with Particular Reference to Asymptomatic Toxoplasmosis in a Young Woman. Arch. Int. Med., *92,* (1953): 314-320.

[41]Sabin, A. B.: Toxoplasmosis: Current Unsolved Problems. Am. J. Trop. Med. and Hyg., *2,* (1953): 630-664.

[42]Sabin, A. B., and Feldman, H. A.: Dyes as Microchemical Indicators of a New Immunity Phenomenon Affecting a Protozoan Parasite. Science, *108,* (1948): 660-663.

[43]Sanger, V. L., Chamberlain, D. M., Cole, C. R., and Farrell, R. L.: Toxoplasmosis. V. Isolation of Toxoplasma from Cattle. J.A.V.M.A., *123,* (1953): 87-91.

[44]Woodruff, A. W.: Toxoplasmosis. Med. Illus., *7,* (1953): 232-237.

[45]Woke, P. A., Jacobs, L., Jones, F. W., and Melton, M. L.: Experimental Results on Possible Arthropod Transmission of Toxoplasmosis. J. Parasitol., *39,* (1953): 523-532.

[46]Westphal, A., and Palm, G.: The Use of Experimental Latent Toxoplasma Infection in Epidemiological Studies. Ztschr. tropenmed u. Parasitol., *4,* (1953): 322-338.

[47]Wickman, N., and Carne, H. R.: Toxoplasmosis in Domestic Animals in Australia. Austral. Vet. J., *26,* (1950): 1-2.

Cerebral Abscesses in a Heifer Due to *Actinomyces Necrophorus*

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There are many conditions which may create a direct or indirect intracranial pressure on the brain. The signs of damaged brain tissue, or expanding lesions with the cranium, may be varied and difficult to diagnose. They are frequently misdiagnosed. A recent experience illustrates the difficulty in making a diagnosis when an animal shows "blind staggers" and "circling." The need of a thorough postmortem examination to find the cause of muscular incoordination can not be overemphasized.

Case Report.—In performing a routine antemortem examination of 80 pen-fed Hereford heifers, 2½ to 3 years old, 1 of the animals appeared to stagger and show a partial incoordination of the forelegs. After being separated from the others in the lot, she moved forward cautiously and showed a pronounced incoordination. The staggering gait, with alternating left and right movements and with intermittent circling, became more intensified until she was completely exhausted. After a short rest, she would rise and move forward cautiously. She did not appear to be totally blind, had no fever, the exposed mucous membranes appeared normal, and there was no atrophy or visible abnormalities.

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To move her to the slaughtering department, it was necessary to place her in with a few of the others in the lot. When among the other animals, normal coordinated movements returned and she moved without any visible difficulty.

The usual postmortem examination of the head revealed nothing abnormal. A few ear ticks were seen near the tympanum but no inflammatory areas or tissue damage was evident. A careful examination of all other organs and tissues, including the spinal cord and adrenal glands, failed to reveal any pathological changes.

The splitting of the cranium is not a usual procedure in postmortem inspections. However, the skull was split lengthwise, along the median line, exposing an extensively diseased brain. Both hemispheres of the cerebrum contained so many abscesses that the normal anatomical appearance and structure was indistinguishable. The abscesses varied from approximately ½ to 2 cm. (0.2 to 0.8 inch) in diameter, were heavily encapsulated, and contained thick adhesive pus. The entire brain was carefully removed from the cranial cavity revealing a brown area on the inner surface of the cranium directly covering one of the badly infected hemispheres. When a slight pressure was exerted on this area with a wooden skewer it easily pierced the bony structure and passed into the horn core. No abnormality could be seen in the horn core nor in the surrounding skull.

Her dressed carcass indicated that she had been fed to an excellent condition.

It was concluded that the infection had entered the cranial cavity through a past injury to the horn and that the abscesses of the cerebrum were a primary seat of infection that had become localized to both hemispheres.

Laboratory findings reported by Dr. C. L. Davis, director of the Branch Pathological Laboratory of the Meat Inspection Branch, Denver, Colo., reported *Actinomyces necrophorus* as the invading causative organism.

Dogs React to Psittacosis Antigen.—A canine disease in France was characterized by pulmonary, intestinal, and nervous symptoms, and fever. The serum of these dogs reacted strongly to antigens of the psittacosis group. After treating the animals with chlortetracycline (aureomycin®), the reactions disappeared.—*Vet. Bull., Aug., 1955.*

Bovine Hyperkeratosis

No new cases of hyperkeratosis in cattle have been reported in this country for more than a year. While some of the outbreaks could be traced to the ingestion of highly chlorinated naphthalene, a few are still unexplained. There is no convincing evidence that any other substances produced the disease. Three species of Aspergillus have been implicated, but the lesions produced were not characteristic and the same lot of processed wheat concentrate, used to make the bread on which the aspergilli were cultured, was shown to contain highly chlorinated naphthalene. The cooperation of oil companies and feed processors in eliminating chlorinated naphthalene from products used on farms has been an important factor in the reduction of the disease.—*J. Dai. Sci., Aug., 1955.*

Equine Infectious Anemia Therapy.—No benefit resulted when affected horses in Japan were treated with chlortetracycline (aureomycin®), 25 mg. per kilogram daily *per os* for ten days, or with chloramphenicol, 50 mg. per kilogram daily *per os* for seven days.—*Vet. Bull., Aug., 1955.*

Live Virus Synthesized

A self-duplicating system, a tobacco mosaic virus, has been assembled from inactive materials which had been produced by separating the same virus into its two main components, protein and nucleic acid, both of which are inactive. This discovery, at the University of California, could lead to the production of avirulent viruses which could bestow immunity to the whole virus.—*Sci. News Letter, Nov. 5, 1955.*

Congenital Aganglionic Megacolon

The cause of Hirschsprung's disease, now more accurately termed "congenital aganglionic megacolon," has until recent years been unkown. The early idea that the seat of the lesion is the dilated portion of the bowel is incorrect (*Am. J. Surg.*, July, 1955: 18-25).

To understand the lesion, one must first understand the anatomy and physiology of

the large intestine. The nerve supply of the large intestine is from Auerbach's plexus located between the two muscular coats and from Meissner's plexus which lies in the submucous layer. Auerbach's plexus mediates the peristaltic waves in the colon and controls the nervous impulses so that the musculature is stimulated at only one point at a time. This results in a well-regulated peristaltic wave, passing along the entire colon from the cecum to the rectum.

However, when Auerbach's plexus is missing in any segment of the large bowel, the nervous impulse is not regulated and this entire segment of the colon undergoes a simultaneous contraction with each stimulus. Thus, any fecal matter in this portion of the bowel is squeezed out, both orad and caudad.

This is what happens in chronic aganglionic megacolon. The dilated portion of the bowel is normal, except for the physiological reactions which accompany chronic obstruction. The portion of the colon that lacks the ganglia of Auerbach's plexus is just distal to the dilated portion. When the nerve impulses from the normal portion reach this aganglionic portion, there is intense spasmodic contraction which arrests the normal peristaltic wave and the propulsion of fecal matter. The bowel absorbs water, the feces become dry and hard, and the obstruction is aggravated by the continuing peristaltic rushes and packing of fecal matter.

The congenital anomaly is corrected by the surgical removal of the entire tube of the aganglionic segment, as well as the transitional area and a sufficient portion of the dilated part to insure the removal of all abnormal colon. This is accomplished by stripping the mesentery from the bowel to the insertion of the levator ani into the anus, and also by stripping a variable portion of the dilated segment orad to the contracted area. In man, 12 to 20 cm. has been suggested as a sufficiently safe orad point. The mesentery then must be resected close to its origin and the blood vessels ligated close to their origin, preserving the arcades and the marginal arteries.

The anus must now be dilated and an Allis clamp inserted from the exterior and directed by a hand in the abdomen to the desired position above the lesion. The bowel is then clamped and drawn backward until it forms an intussusception through the anus. It is drawn out until the point which has been elected is in the proper position for anastomosis to the anus. A two-layer anastomosis may be done, cutting away at the same time the diseased portion of the bowel. When completed, the newly formed anastomosis is pushed back into the body through the anus.—*Jack H. McClure, D.V.M., Illinois.*

Diagnosis of Canine Piroplasmosis.—An increase in piroplasmosis in hunting dogs is reported from France. Two minor signs which aid in diagnosis are blanching and edema of the scleroto-conjunctival margin and abnormally pale or yellow feces. Rheumatoid symptoms occur as a complication. —*Vet. Bull., Aug., 1955.*

Dogs with Certain Diseases Wanted for Treatment

Dr. N. R. Brewer, veterinarian at the University of Chicago, is interested in obtaining dogs with the following diseases: leukemia, muscular dystrophy, certain types of cancer, anemia, diabetes, pancreatic disease, and senile cataracts (no other eye diseases).

These dogs are wanted in order to try specific treatments, in the research stage. They will be used for no other purpose. The University of Chicago will make arrangements for transportation, and there will be no charges for the treatment of any of these animals.

Funds are available for the transportation of dogs with symptoms of leukemia or muscular dystrophy from any part of the country. But only limited funds are available for the transportation of dogs with cancer, anemia, senile cataracts, diabetes, and pancreatic disease, and for this reason such dogs should come from the Chicago area.

If you care to help in this project, please address: Dr. N. R. Brewer, 951 E. 58th St., Chicago 37, Ill.

New Antifungal Antibiotic.—*"Filipin."* —A potent antibiotic against fungous diseases of man and his food crops has been discovered in soil organisms in the Philippine Islands. It closely resembles the fungicide "fungichromin."—*Sci. News Letter, Oct. 22, 1955.*

Demonstration of *Demodex Equi* (Railliet, 1895) from a Horse in Minnesota

EVERETT D. BESCH, D.V.M., and
HENRY J. GRIFFITHS, D.V.M., Ph.D.

St. Paul, Minnesota

Although demodectic mange mites have been reported as occurring in the skin of most of the large and small domestic animals, the reported incidence of demodectic infestation is not a true indication of the occurrence of this parasite. Hirst[1] reported that species of Demodex usually appear innocuous and that their presence apparently causes little inconvenience to the host; however, a distinct pathological condition of the skin may result. He states further that mites of this genus are often found in horses which are free from any clinical evidence of the disease. Bennison[2] demonstrated Demodex from the eyelids of 17 of 132 horses, but in only 1 did clinical examination reveal any abnormality of the skin. The examination of skin scrapings from 145 horses taken from areas of the body other than the eyelids and muzzle revealed 2 of the group to be infested with Demodex.

Demodectic or follicular mange of the horse has been reported in Europe and in South America.[2-8] The assumption that this mite is usually present in the skin of horses in company with another parasite was challenged by Williamson and Oxspring.[5] They demonstrated Demodex in 40 horses but in only 1 was the condition complicated by a sarcoptic acariasis. They concluded that in the absence of other parasites, Demodex was responsible for producing the described lesions. To date, demodicosis of horses does not appear to have been reported in North America.

This is a report of the demonstration of *Demodex equi* (Railliet, 1895) in the skin of a colt.

CASE REPORT

In February, 1955, a 7-month-old male Standardbred colt was presented at the

From the Division of Veterinary Pathology and Parasitology, School of Veterinary Medicine, University of Minnesota, St. Paul.

Paper No. 3352 scientific journal series, Minnesota Agricultural Experiment Station, St. Paul.

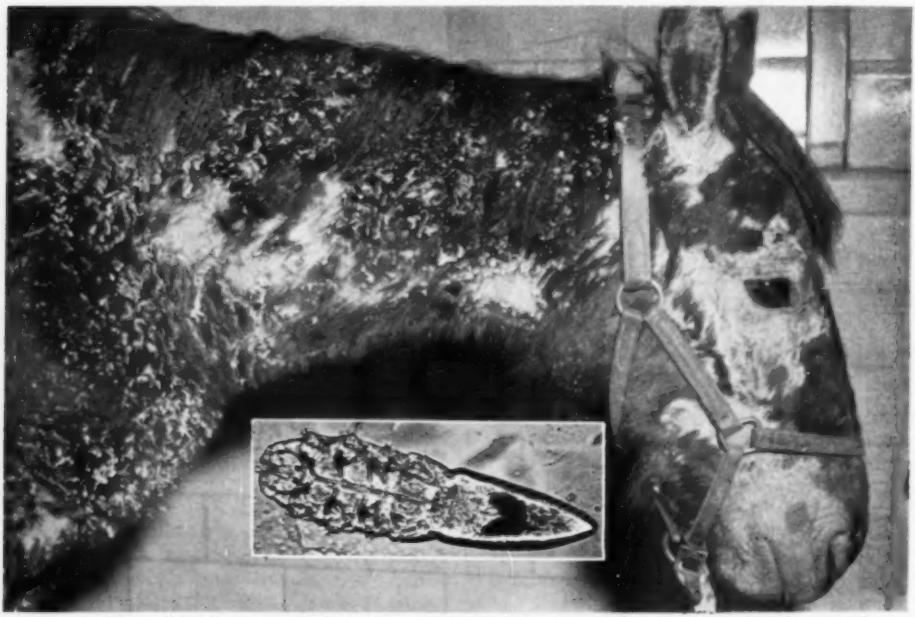

Fig. 1—The colt as it appeared when presented at the clinic. Inset—Demodex equi, female, ventral view. x 450.

Large Animal Clinic, School of Veterinary Medicine, University of Minnesota. The admission complaint was severe anemia and pityriasis with inappetence, loss of weight, and depression. The colt died ten days after admission.

The anterior part of the animal's body (fig. 1), including the forelimbs and head, showed denuded areas which were not clearly defined but were patchy and ragged. Large, branny scales were intermingled with the hair. The hairs in the affected regions pulled out easily and were held together by a thin, white, flaky crust. The skin was pale and lacked tone. No pustules were observed.

The initial skin scraping, in which 1 mite was observed, was taken from the right dorsolateral region of the thorax. Two additional mites were observed in a repeat scraping from the same area. In all, 42 skin scrapings were made from areas on the head, muzzle, ears, neck, withers, and thorax. Twelve mites were observed in nine of these scrapings. The regions of the body from which mites were demonstrated were the right thorax, right withers, and left thorax. All skin scrapings were made with the use of mineral oil and a medium-sharp scalpel. A total of 31 mites were isolated from this animal, 12 from skin scrapings and 19 from macerated tissue. Postmortem examination of microscopic sections of the areas where the mites were demonstrated revealed 3 mites situated within hair follicles.

This species of Demodex (fig. 1, inset) is short, stout, and wider than other mites of this genus. The cephalothorax is longer than the abdomen. The width of the cephalothorax is about one-third the total length of the mite. The abdomen ends posteriorly as a rounded, tapering or blunt extremity. The over-all length of the mite is quoted as 173 to 236 μ.[1,2] Of 6 specimens measured from those demonstrated on this animal, the over-all length ranged from 184.8 to 239.7 μ.

Following a review of the literature, Bennison[2] reported the possibility of two morphologically distinct species of Demodex in the horse. In his study of demodicosis in the horse, elongated mites were found in the eyelids, meibomian gland, and skin of the muzzle of some horses. He referred to this species as *Demodex folliculorum* var. *equi*. A second morphologically distinct Demodex was isolated from the skin of parts of the body other than the eyelids and muzzle. This species was short and stout and had been previously described by Hirst. It was referred to as *D. equi*. Bennison's paper includes a table summarizing the comparative morphology of the two species.

It is not implied that the presence of the *D. equi* was partially or wholly responsible for the skin condition of this horse; rather, the furfuraceous desquamation is believed to be the factor which enabled the demonstration of the parasite. Bennison questioned the efficacy of skin scraping with a blunt scalpel in the detection of mites in the horse; his examination of histological sections of scraped areas revealed that only the epidermis is unevenly removed by this method. He recommended squeezing of the skin to evacuate superficial skin glands and repeated scrapings of an area to increase the efficiency of this method.

In this colt, examination of 42 skin scrapings from various areas of the body, along with (postmortem) nine macerated skin samples and 86 microscopic sections from these same areas, revealed only the short, stout species of Demodex described by Hirst, Bennison, and Pillers. The habitat of this species in this case concurs with those areas reported by Bennison.

References

[1]Hirst, Stanley: Studies on Acari. No. 1. The Genus *Demodex*. Owen. British Museum (Natural History), London (1919): 6-7, 29-30.

[2]Bennison, J. C.: Demodicosis of Horses with Particular Reference to Equine Members of the Genus *Demodex*. J. Roy. Army Vet. Corps, *14*, (1943): 34-49, 66-73.

[3]Berger: Acariasis in the Horse. Vet. J., *67*, (1911): 383.

[4]Linton, R. C.: The Presence of *Demodex Folliculorum* in the Horse. Vet. J., *72*, (n.s. 23), (1916): 79-80.

[5]Williamson, G., and Oxspring, G. E.: Demodectic Scabies in the Horse. Vet. J., *76* (n.s. 27), (1920): 376-379.

[6]Pillers, A. W. Noel: Notes on Mange and Allied Mites for Veterinarians. Bailliere, Tindall and Cox, London (1921): 14-16.

[7]Nevue-Lemaire, M.: Traite D'entomologie, Medicale et Veterinaires. Vigot Freres, Editeurs, Paris (1938): 196-197.

[8]Railliet, A.: Traites de Zoologie Medicale et Agricole. 2nd ed. Libraires de la faculte de Medecine et de la Societe Centrale de Medecine Veterinaire, Paris (1895): 639.

A Nematode Parasite, *Murshidia Falcifera* (Cobbold, 1882) from an Indian Elephant

S. M. GAAFAR, D.V.M., Ph.D., and
R. D. TURK, D.V.M., M.S.

College Station, Texas

A necropsy was performed* on an aged female elephant that had been in the United States for 40 years. At the beginning of her terminal illness, she weighed 7,200 lb. and her age was estimated as being between 85 and 120 years old. Death was believed due to a coronary occlusion. Contributing factors were infected footpads, old chronic harness sores and, possibly, the infirmities of old age. Several nematodes were found in the colon and were forwarded to the Department of Veterinary Parasitology (A. & M. College of Texas) for identification. Both male and female nematodes were present in the material submitted. They were identified as *Murshidia falcifera* (Cobbold, 1882).[1]

Whether the elephant acquired the infection in the United States or the nematodes survived in its intestinal tract for 40 years or longer is a matter of speculation.

This parasite evidently occurs frequently in elephants. It is classified under the family Strongylidae[2] and, macroscopically, resembles the large strongyles of horses. Presumably, its life history is also similar to that of other members of the strongyle group.

References

[1]Yorke, W., and Maplestone, P. A.: The Nematode Parasites of Vertebrates. P. Blakiston's Son & Co., Philadelphia, Pa. (1926): 536.

[2]Westhuysen, O. P.: A Monograph of the Helminth Parasites of the Elephant. Onderstepoort J., Vet. Sci. and Anim. Indust., *10*, (1938): 49-190.

Instructor (Gaafar) and head (Turk), Department of Veterinary Parasitology, A. & M. College of Texas, College Station.

*The necropsy was performed by Dr. Charles L. Boyd, veterinary practitioner at Grandview, Texas.

Dentures for Cows.—When an aged cow had trouble eating, her owner (a dentist) found that she had lost several center incisor teeth. He made a plate and anchored it to her lateral incisors until the latter loosened and the plate had to be removed.—*Am. Cattle Producers, Oct., 1955.*

A Periodic Ophthalmia Study

The serum of 12 of 35 horses affected with periodic ophthalmia had agglutinin titers of 1:1,000 to 1:3,000 against *Leptospira pomona*. This organism could not be isolated from the aqueous humor of affected eyes, nor could the disease be reproduced by inoculating healthy horses with *L. pomona* cultures. Penicillin applied locally or systemically had no effect on the course of the disease.—*Vet. Bull., May, 1955.*

Nitrogen Mustard for Leptospirosis

When dogs with leptospirosis (positive to *Leptospira canicola* and *Leptospira icterohaemorrhagiae*) were treated intravenously with nitrogen mustard, 0.6 mg./1 kg., all died in three days. Of a younger group treated with penicillin, all except 1 recovered. All received caffeine, saline, and glucose also. Treatment started when jaundice appeared. While nitrogen mustard has bacteriostatic properties against Leptospira *in vitro*, it seems ineffective *in vivo*.—*Vet. Bull., Sept., 1955.*

Hormones and Egg Production.—By the use of hormones to start hens molting, it may be possible to bring them into heavy production at a time when egg prices are starting to rise.—*University of Wisconsin Release.*

Experimental Avian Leptospirosis.—Day-old chicks inoculated with *Leptospira canicola* sometimes showed leptospiremia as long as 28 days and agglutinins from about 16 to 50 days, but the chicks showed no signs of infection and no inhibitory substances were found in their serums.—*Cornell Vet., July, 1955.*

Nocardiosis in Man

Two fatal cases of nocardiosis in young men are reported in the *Journal of the American Medical Association* (June 18, 1955). Both apparently originated with pulmonary infection, one terminating with a brain abscess and the other with a huge retroperitoneal abscess. Only about 65 human cases have been reported but as the diagnosis has usually been made postmortem, the incidence may be greater. It is amenable to therapy in the early stages.

What Is Your Diagnosis?

Because of the interest in veterinary radiology, the JOURNAL publishes this month, and will continue to do so for the next several issues, a case history and accompanying radiographs depicting a diagnostic problem.

Make your diagnosis from the picture below—then turn the page ▸

Figure 1

History.—A German Shepherd puppy, 12 weeks old, had suffered from persistent vomiting ever since it was able to lap its food. Liquids were regurgitated through the nose. Barium solution was given by mouth and a radiograph was taken (fig. 1).

(Diagnosis and findings are reported on next page)

Here Is the Diagnosis

(Continued from preceding page)

Diagnosis.—Mega esophagus (congenital hypertrophic dilatation of the esophagus).

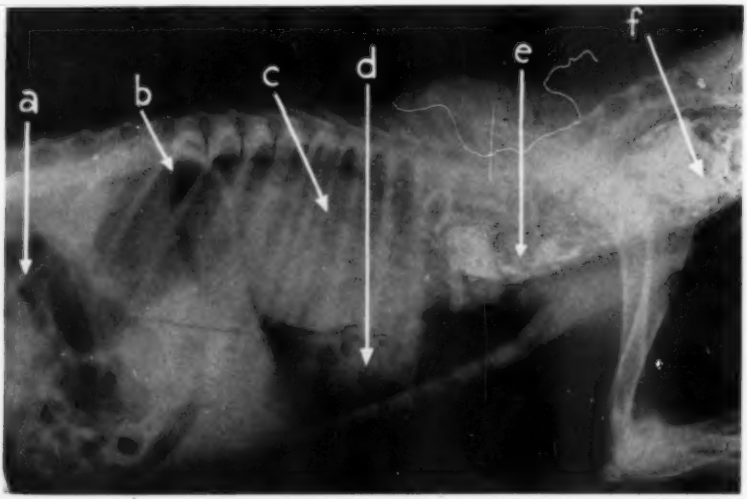

Figure 2

Comment.—Figure 2 is a radiograph showing the intestines (a), diaphragm (b), cardiac portion of the esophagus (c), heart (d), thoracic portion (e), and cervical portion (f) of the esophagus.

Euthanasia was administered and the specimen was preserved, a photograph (fig. 3) of which shows the tongue (g), cervical portion of the esophagus (h), lungs (i), cardiac portion of the esophagus (j), and the stomach (k).

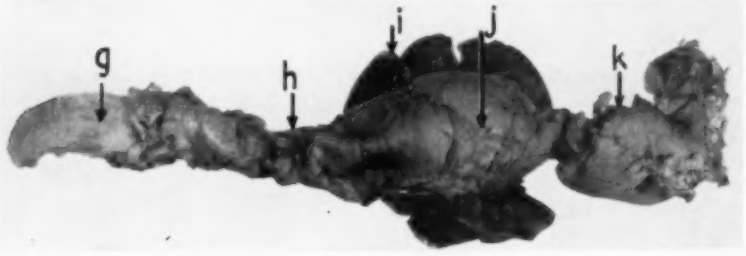

Figure 3

Our readers are invited to submit case histories, radiographs, and diagnoses of interesting cases which are suitable for publication.

This case was submitted by Dr. T. J. Lafeber and Jean Beckwith, Niles, Ill.

Leptospirosis in Domestic Animals in Florida with Reference to Cattle

MILDRED M. GALTON, Sc.M.; JAMES A. ACREE, D.V.M.; ARTHUR LEWIS, D.V.M.; E. CHARLTON PRATHER, M.S.

Jacksonville, Florida

INTEREST IN THE problem of leptospirosis has changed rapidly. It is apparently a group of widely distributed infections of considerable economic significance and a potential public health hazard. In Florida, prior to 1951, requests for aid in the laboratory diagnosis of Leptospira infection in human beings were rare and were confined to the classic Weil's disease. On clinical grounds, veterinarians occasionally suspected the disease in dogs, but it had not been diagnosed in cattle.

It was first observed as a disease problem in dairy cattle in Florida by one of the authors (J.A.A.) in May, 1951. Blood specimens sent to the Communicable Disease Center laboratories in Atlanta gave positive titers of 1:4,000 in the agglutination test using *Leptospira pomona* formolized antigen. Serological evidence of infection was obtained in three other local dairy herds during the year and a study of the disease in Florida was initiated. Later that year, veterinarians requested laboratory aid in the diagnosis of leptospirosis in dogs and additional requests for assistance were received from physicians. The need for leptospiral diagnostic laboratory services in the state then became obvious.

METHODS

The agglutination test with formolized Leptospira antigens, according to the procedure recommended by Ward,[1] was employed.

During the summer of 1952, arrangements were made with the Veterinary Division of the Army Medical Service Graduate School whereby they would provide this laboratory with their sonic-vibrated, leptospiral, complement-fixing antigens.[2] Aliquots of all serums examined by the complement-fixation test were forwarded to their laboratory for check testing and, in some instances, these serums were tested by the agglutination-lysis method. The complement-fixing antigens employed included *Leptospira icterohaemorrhagiae, Leptospira byos, L. pomona,* and *Leptospira grippotyphosa.* These four antigens were not used consistently in this laboratory, but at least two of them, and usually three, were used routinely. In the Army laboratory, the first three antigens were used on all Florida specimens, and *L. grippotyphosa* was included on many.

Since mailed specimens generally are not satisfactory for the isolation of Leptospira, either by direct culture or animal inoculation, such studies were limited to local cases, primarily in dairy cattle. At the request of the practitioners, members of the laboratory staff collected the samples and inoculated culture mediums and hamsters immediately. On two occasions, hamsters were inoculated with urine from dogs and shipped to this laboratory by air express.*

The isolation techniques followed closely those recommended by Gochenour[3] in which Fletcher's semisolid medium was employed both for direct culture of blood or tissue suspensions and for blood culture of the inoculated hamsters.

For animal inoculation, 20- to 21-day-old golden hamsters were used, 3 to 5 being inoculated intraperitoneally with 0.3 to 0.5 ml. of each specimen of catheterized urine or tissue suspension from cattle. In a few instances, milk and saliva from ill cows were inoculated into hamsters.

FINDINGS

During the three-year period (1951-1954), a total of 1,296 serum samples were received for serological examination from suspected cases of leptospirosis. Of these, 38.0 per cent were positive by agglutination or complement-fixation or both. Most (847) were from dairy cattle, of which 41.5 per cent were positive. In many in-

From the Bureau of Laboratories, Florida State Board of Health, Jacksonville, Fla., and the U. S. Department of Health, Education, and Welfare, Public Health Service, Communicable Disease Center, Atlanta, Ga. Mrs. Galton is now at the Communicable Disease Center, P.O. Box 185, Chamblee, Ga.

This paper was presented, in part, at the annual meeting of the Animal Disease Research Workers of the Southern States, Auburn, Ala., April 8, 1954.

The assistance and cooperation provided by Dr. Martha Ward, Communicable Disease Center, Chamblee, Ga., in examining many of the specimens reported here and in the establishment of diagnostic tests in this laboratory is gratefully acknowledged.

The Veterinary Division, Army Medical Service Graduate School, Washington, D. C., provided the sonic-vibrated, complement-fixing antigen and examined many of the serum samples. The agglutination-lysis tests reported here were performed in their laboratory. The generous assistance and advice offered by the staff, Veterinary Division, Army Medical Service Graduate School, Washington, D. C., is greatly appreciated.

*These hamsters were shipped by Dr. C. E. Bild, Miami, Fla. He was the first veterinarian to request laboratory aid with canine specimens in 1951, and submitted the majority of the canine serums tested.

stances, samples were obtained from cows during the acute and convalescent stages of the disease. Of the 271 canine serums, 50.0 per cent showed a positive agglutination reaction. In contrast, only 1.8 per cent of the 162 serums from human beings showed an agglutination reaction in titers of 1:64 or above, or a positive complement-fixation test (table 1).† Serums from three entire dairy herds (R, M, and D) in Duval County, and one (B) in Jefferson County were examined serologically (table 2). All herds included animals which previously had shown clinical signs and serological evidence of Leptospira infection. Of 807 serums examined, 252 (31.1%) gave positive tests.

Representative samples obtained from four other herds, in widely separated areas,** with no clinical histories showed no reactors in two herds (CB and MV, table 2), but in the other two herds (IG and BD) 21.5 per cent were positive.

Hamsters were inoculated at the farms with 45 urine samples taken from cows during the acute or convalescent stage of illness. *Leptospira pomona*‡ was isolated from 4 cows (1 each in tables 3 and 4) in different herds. No isolations were obtained from 22 samples of bovine tissue and 4 samples of milk inoculated into hamsters. One of 3 hamsters inoculated with dog urine yielded *L. icterohaemorrhagiae*, and it is believed that this is the second time that this serotype has been isolated from a dog in the United States.[4] Direct culture of blood and tissue emulsions from cattle yielded no Leptospira.

Herd R.—In June, 1952, at the Communicable Disease Center laboratory, serums from 3 cows in herd R showed a positive agglutination test in dilutions of 1:1,024 or 1:4,000 with formolized *Leptospira canicola* antigen, and a negative test with *L. icterohaemorrhagiae* and *L. pomona* antigens. Due to this rather unusual finding, the serums were forwarded to the Veterinary Division, Army Medical Service Graduate School, for further study and were found to react in high titer in the agglutination-lysis test to antigens of the *L. hebdomadis* group. These diverse results may well reflect a difference in the two tests (agglutination with formolized antigen and agglutination-lysis), or it may have been due to the fact that formolized test antigens of some serotypes may show broader cross reactivity. Until that time, *L. hebdomadis* and *Leptospira sejroe* antigens were not included in the routine examination at the Communicable Disease Center laboratories. The same 3 cows, and other new cases in the herd, were bled again and the second specimens showed a rise in titer with *L. sejroe* (Mallersdorf)

TABLE 1—Serological Examinations of Animal and Human Serums for Leptospira in Florida

Diagnostic serum samples received	1951		1952		1953		1954 (5 mo.)		Total		
	No.	Pos.	No.	Pos.	No.	Pos.	No.	Pos.	No.	Pos.	(%)
Bovine	21	11	157	85	289	133	380	123	847	352	41.5
Canine	3	0	65	29	137	84	66	23	271	136	50.0
Human	19	0	16	0	91	2	36	1	162	3	1.8
Equine	....	....	1	0	6	0	1	1	8	1	12.5
Porcine	....	....	3	0	1	0	3	1	7	1	14.2
Deer	....	....	....	....	1	0	....	....	1	0	0
Total	43	11	242	114	525	219	486	149	1,296	493	38.0

TABLE 2—Serological Findings on Herd Survey Samples Examined for Leptospirosis by Agglutination or Complement-Fixation Test or Both

Herd	Samples (No.)	Pos.	(%)
R	182	159	87.3
M	118	35*	29.6
D	335	50*	14.8
B	172	8	4.6
Total	807	252	31.1
IG	35	10	28.5
BD	118	22	18.6
CB	38	0	0
MV	40	0	0
Total	231	32	13.8
Grand total	1,038	284	27.3

*Complement-fixation tests performed only.

†A serum was considered positive if it reacted in a dilution of 1:64 in the agglutination test with formolized antigens, 1:100 in the agglutination-lysis test, or if a reaction of 2+ was obtained by complement-fixation.

**These samples were obtained through the cooperation of the local U.S.D.A. Agricultural Research Service laboratory.

‡Identified by the Veterinary Division, Army Medical Service Graduate School, Washington, D. C.

TABLE 3—Serological Findings on Samples from 20 of 118 Cows in Herd M

	9-26-51		11-3-51			3-31-51			6-27-52					7-31-52				6-9-53		1-11-54			1-28-54				2-9-54	
	Agglutination with formolized antigen								(AF)					CF	AF				CF	AL	CF	AL		CF	AL			CF	AL	
Cow (No.)	c	p	i	c	p	i	c	p	i	c	p	h	s	p	i	c	h	s	p	s	p	s	p	p	s	p	i	p	s	p
R17	1,024	4,000	....	....	....	....	....	....	—	—	—	d°	d	d	....	....	8	16	....	....	....	....	....	+	100	....	....	....	....	....
No50	d	d	d	d	d	....	....	....	....	....	....	....	....	+	16	8	64	—	....	....	....	....	....	....	....	....	....	....	....	....
R35	1,024	—	....	....	....	....	....	....	....	....	....	....	....	—	....	....	16	16	....	....	....	....	....	....	....	....	....	....	....	....
46	....	....	—	16	—	....	....	....	....	....	....	....	....	—	....	....	—	—	....	....	....	....	....	....	....	....	....	....	....	....
151	....	....	—	64	—	....	....	....	....	....	....	....	....	—	....	....	16	—	....	....	....	....	....	....	....	....	....	....	....	....
134	....	....	d	32	d	....	....	....	....	....	....	....	....	d	16	16	128	—	....	....	....	....	....	....	....	....	....	....	....	....
R48	....	....	64	512	64	....	....	....	....	....	....	....	....	d	....	....	16	16	....	....	....	....	....	....	....	....	....	....	....	....
R5	....	....	....	....	....	—	512	—	—	—	—	1,024	64	—	....	....	....	....	—	100	—	25	....	—	25	....	....	....	....	....
R14	....	....	....	....	....	....	....	....	—	16	d	8	8	+	16	16	64	16	....	....	....	....	....	+	400	25	....	....	....	....
R23°	....	....	....	....	....	....	....	....	....	....	....	....	....	d	....	....	—	—	....	....	+	100	....	+	400	25	....	....	....	....
R21°	....	....	....	....	....	....	....	....	....	....	....	....	....	—	....	....	16	16	....	....	+	25	....	+	25	400	....	....	....	....
35°	....	....	....	....	....	....	....	....	....	....	....	....	....	—	....	....	....	....	....	....	+	QNS	....	—	....	25	....	....	....	....
3	....	....	....	....	....	....	....	....	....	....	....	....	....	—	16	....	64	....	....	....	....	....	....	+	25	....	25	....	....	....
LB°	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	+	25	6,400	+	25	25,600	....	....	....	....
R56°	....	....	....	....	....	....	....	....	....	....	....	....	....	+	....	....	32	128	....	....	+	100	400	+	100	100	....	....	....	....
283	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	+	....	25,600	100	....	....	....
287°	....	....	....	....	....	....	....	....	....	....	....	....	....	—	....	....	8	32	....	....	—	400	....	....	....	....	....	....	....	....
R74°	....	....	....	....	....	....	....	....	....	....	....	....	....	d	....	....	....	....	....	....	—	400	—	....	100	....	....	....	....	....
55°°	....	....	....	....	....	....	....	....	....	....	....	....	....	d	....	....	8	16	....	....	+	—	1,600	+	....	400	....	+	25	400
279°	....	....	....	....	....	....	....	....	....	....	....	....	....	—	....	....	....	....	....	....	—	—	—	....	....	....	....	....	....	....

AF = agglutination with formolized antigen; AL = agglutination-lysis; CF = complement-fixation; c = Leptospira canicola antigen; p = L. pomona antigen; i = L. icterohaemorrhagiae antigen; h = L. hebdomadis antigen; s = L. sejroe antigen; QNS = quantity insufficient.

°During the period Dec. 11, 1953, and Jan. 11, 1954, these cows aborted in the fourth to eighth month of pregnancy. °°Leptospira pomona isolated from the blood of a hamster inoculated with urine Feb. 9, 1954.

(See page 90 for TABLE 4)

TABLE 5—Serological Findings on 11 of 172 Animals in Herd B

Animal (No.)	Bleeding Dates: 2-5-53 CF[2]	2-5-53 AL[3]	3-17-53 CF[2]	3-17-53 AL[3]	5-10-53° CF[3]	5-10-53° AL[1]	5-22-53° CF[4]	5-22-53° AL[3]	7-24-53 CF[5]	7-24-53 AL[3]	9-8-53 CF[5]	9-8-53 AL[3]
79	—	100MV	—	1,600MV	—	400MV	—	100MV	—	—	....	....
14	....	....	....	....	2+MV-X	—	—	—	....	....	....	....
22	....	....	....	....	—	400MV	—	400MV	—	100MV	....	....
25	....	....	....	....	—	1,600MV	—	—	....	....	....	....
64	....	....	....	....	—	400MV	—	100MV	—	—	....	....
110	....	....	....	....	—	—	2+MV-X	—	—	—	....	....
118	....	....	....	....	—	100MV	—	—	—	—	....	....
149	....	....	....	....	—	—	1+MV-X	—	—	—	....	....
153	....	....	....	....	—	400MV	—	400MV	—	—	....	....
178	....	....	....	....	—	—	—	1,600MV	—	—	....	....
165	....	....	....	....	4+MV-X	1,600MV	2+MV-X	400MV	3+MV-SV	400MV	2+MVSV	1,600MV

Antigens used: [1]pomona, grippotyphosa, and sejroe; [2]icterohaemorrhagiae SV, grippotyphosa SV, and hyos SV; [3]icterohaemorrhagiae SV, grippotyphosa SV, and grippotyphosa X; [4]icterohaemorrhagiae SV, grippotyphosa SV, pomona SV, and grippotyphosa X; [5]icterohaemorrhagiae SV, grippotyphosa SV, and pomona SV.

MV = Moscow V strain of grippotyphosa; SV = sonic-vibrated, complement-fixing antigens; X = soluble specific antigen.

°On these dates the entire herd was bled and tested; the remaining 161 animals were negative on both dates.

TABLE 4—Serological Findings on 8 of 330 Cows in Herd Y

Cow (No.)	2-12-54					2-19-54		2-24-54					3-16-54				
	AL*					AL*		AL*					AL*				
	CF	p	s	i	g	CF	s	CF	p	s	i	g	CF	p	s	i	g
9278	—	6,400	100	....	....	....	....	—	....	100	....	....	....	....	....	....	....
839**	+	1,600	100	....	....	....	....	+	1,600	100	25	100	+	400	25	....	....
840	+	1,600	25	....	....	....	....	+	1,600	25	25	25	+	1,600	25	....	....
995	+	6,400	6,400	100	....	....	....	+	....	400	....	....	+	6,400	1,600	100	25
Bull	—	QNS	....	....	....	....	....	+	400	400	....	....	+	100	400	....	....
211	+	6,400	400	100	100	....	....	....	....	....	....	....	....	....	....	....	....
1155	....	....	....	....	....	—	100	—	....	25	....	....	—	100	....	....	25
729	....	....	....	....	....	+	—	....	....	....	....	....	....	....	25	....	....

**Leptospira pomona isolated from hamster inoculated with urine Feb. 12, 1954; cow aborted Feb. 12, 1954.
AL = agglutination-lysis; CF = complement-fixation; p = L. pomona antigen; i = L. icterohaemorrhagiae antigen; h = L. hebdomadis antigen; s = L. sejroe antigen; QNS = quantity insufficient.

strain.[5] This was the first serological indication of infection in cattle in the United States with a serotype of the *hebdomadis* group.[6] All attempts to isolate Leptospira from the blood of acutely ill animals or from the urine of convalescent cases were unsuccessful. Serological examination of the 182 animals in the herd (table 2) revealed 155 (85.1%) positive by agglutination-lysis with *L. sejroe* antigen in titers ranging from 1:100 to 1:102,400 while only 5 appeared positive with *L. pomona* antigen in dilutions of 1:400 or less. In addition, 4 (2.2%) were positive by complement-fixation alone. Details of this study will be reported elsewhere.[5]

Herd S.—In late October, 1952, serums from 2 cows in a local herd were positive in dilutions of 1:400 and 1:6,400, respectively, in the agglutination-lysis test with *L. sejroe* antigen, but showed no reaction with *L. pomona* antigen. The animals showed clinical signs of leptospirosis but urine inoculated into hamsters yielded no Leptospira. Exactly one year later, another cow in this herd developed signs of leptospirosis. Her serum, taken a week after onset, was positive by complement-fixation and by agglutination-lysis in a dilution of 1:1,600 with *L. sejroe* antigen but negative with *L. pomona* antigen. Her urine was inoculated into 4 hamsters and *L. pomona* was isolated from the blood of 2 of the 4 when cultured on the eighth and thirteenth postinoculation days, respectively. Unfortunately, a second serum was not obtainable from this cow as she was slaughtered due to her failure to resume normal milk production.

Herds M and Y.—During the early part of 1954, *L. pomona* was isolated from the blood of 1 of 4 hamsters inoculated with urine from cow 55 in herd M (table 3) and cow 839 in herd Y (table 4). From cow 55, only the hamster blood cultures on the thirtieth postinoculation day showed Leptospira, cultures taken on the seventh, ninth, and fourteenth days being negative. Herds M, Y, and R are on adjoining farms and have had periodic outbreaks of leptospirosis since 1951. Here, also, serology has shown the presence of agglutinin antibodies to both *L. sejroe* and *L. pomona* (tables 3 and 4).

Herd B.—Serological examination has suggested infection with *L. grippotyphosa* also in this herd. In contrast to other herds, there was no serological evidence of Leptospira of any other type and only 11 of 172 cows showed positive serological reaction with *L. grippotyphosa* on two bleedings, ten days apart (table 5). Isolation attempts were unsuccessful. Abortions occurred in the wife of the owner of the herd and in an employee of the dairy shortly after the outbreak but no serum samples from these individuals could be obtained.

Clinical Signs in Cattle

In general, animals in the infected herds followed the usual pattern of loss of appetite, fever, and reduced milk production and the milk frequently became thick, yellowish and, occasionally, bloody. Hemoglobinuria was relatively rare and only 2 fatal cases have come to the attention of the authors. Of major concern to the dairymen and veterinarians has been the slow return of many animals to full milk production and the not infrequent failure to resume normal production. Abortion has occurred commonly in infected herds.

Comment

The high proportion of cattle in which *L. sejroe* antibodies were demonstrated is suggestive, but does not constitute evi-

dence, of infection with a Leptospira serotype of the *hebdomadis* group. Agglutination-lysis tests performed on serums of 802 cattle from 54 Florida herds revealed the presence of *L. sejroe* antibodies in 310, *L. pomona* in 85, *L. grippotyphosa* in 25, *L. icterohaemorrhagiae* in 20, and *L. canicola* in 10.

It is believed that herd R represents the first instance in which *L. sejroe* agglutinins were observed in cattle in the United States. Almost simultaneously, similar findings were obtained from cattle in Louisiana, Virginia, and Iowa.[6] Apparently all attempts to isolate *L. sejroe* or a member of the *hebdomadis* group from suspected cattle in the United States have met with failure.

Leptospira sejroe infection was first reported by Borg-Petersen[7] in man in Denmark. More recently, serological evidence of this type was found in cattle in Denmark and central Europe.[8] In considering the significance of *L. sejroe* antibodies observed in such a high percentage of serums from Florida cattle, a number of factors may be involved. First, there is the possibility of "paradoxical reaction" in which a high agglutination titer for a heterologous serotype appears in the blood during the early stage of the disease and homologous antibodies rise later.[9] Second, the failure to isolate the organism may be due to the lack of a susceptible test animal, since the authors failed to recover *L. sejroe* from the blood of hamsters or day-old chicks inoculated intraperitoneally with a culture of the Mallersdorf strain. Last, the isolation of *L. pomona* from 1 cow showing *L. sejroe* agglutinins raises the question of whether there is only one Leptospira type in Florida cattle or whether infections with more than one type such as described by Gsell[10] exists. The presence of *L. pomona* infection, alone, is supported by the isolation of this type from 1 cow in each of three other herds. Certainly, further serological and bacteriological studies are indicated.

SUMMARY

1) Human and animal serums were submitted for diagnosis from suspected cases of leptospirosis. A total of 1,296 samples were examined; 493 (38%) were positive by complement-fixation or agglutination tests or both. Of these, 847 were from dairy cattle, with 352 (41.5%) positive, and 271 were from dogs, with 136 (50%) positive. There were only 3 (1.8%) positive reactions from the 162 samples from human beings.

2) Of 807 survey samples obtained from four dairy herds during outbreaks of leptospirosis, 252 (31.1%) gave positive tests. Representative samples from four other herds in which the clinical history was not known yielded 32 (13.8%) positive reactions from 231 serums.

3) *Leptospira pomona* was isolated from hamster blood inoculated with urine from 4 cows in different herds. *Leptospira icterohaemorrhagiae* was isolated from the blood of 1 hamster inoculated with urine from a dog.

4) The high proportion of cattle in which *Leptospira sejroe* antibodies were demonstrated is discussed.

5) Further bacteriological and serological studies should be undertaken to determine whether cattle in this area are infected with serotypes other than *L. pomona*.

References

[1]Ward, Martha K.: Personal communication.

[2]Randall, R., Wetmore, P. W., and Warner, A. R.: Sonic-Vibrated Leptospira as Antigens in the Complement-Fixation Test for the Diagnosis of Leptospirosis. J. Lab. Clin. Med., *34*, (1949): 1411-1415.

[3]Gochenour, W. S., Jr., Yager, R. H., Wetmore, P. W., and Hightower, J. A.: Laboratory Diagnosis of Leptospirosis. Am. J. Pub. Health, *43*, (1953): 405-414.

[4]Yager, R. H.: Personal communication.

[5]Acree, J. A., Galton, M. M., Gochenour, W. S., Jr., Ward, M. K., and Yager, R. H.: A Second North American Bovine Leptospira. In manuscript.

[6]Yager, R. H.: Leptospirosis in the United States Today. Symposium on the Leptospiroses. Med. Sci. Pub. No. 1, Army Medical Service Graduate School, 1952.

[7]Borg-Petersen, C., and Christensen, H. I.: Et tilfelde of Leptospirose. Ugesk. f. laeger, *101*, (1939): 697-700.

[8]Gsell, O.: Leptospirosen. Medizinischer, Verlag Hans Huber, Bern, 1952.

[9]Broom, J. C.: Discussion. Symposium on the Leptospiroses. Med. Sci. Pub. No. 1, (1952): 166-169.

[10]Gsell, O.: Zweimalige Leptospireninfektionen. Klin. Wchnschr., *25*, (1954): 604-608.

Vesicular stomatitis appeared in Georgia in 1955 as it did in 1952 and 1953. It usually begins in mid-May and ends by September 1.—*Georgia Vet., July, 1955.*

Self-Retention Catheter for Cows

A urine catheter with an inflatable (Foley) urethral catheter, which is passed through the cow's urethra and the balloon portion inflated with 50 to 75 ml. of warm water, has been left in place for three weeks without causing irritation. (The catheter is distributed by C. R. Bard, Inc., Summit, N. J.)—*J. Dai. Sci., Sept., 1955.*

Swine Enteritis. I. Terramycin in the Treatment of Diarrhea of Suckling Pigs

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There are many baby pig diseases discussed in the veterinary literature in which the terms "enteritis," "scours," or "diarrhea" are frequently used. In many cases, diarrhea or scouring is the major symptom associated with an enteritis. Since the literature in this field is so voluminous, no attempt will be made to review it.

The following report is based on clinical observations made by the authors on swine with diarrhea in the North Dakota Agricultural College swine drove and in a few instances by veterinarians engaged in private practice. The etiological agent was not determined as bacteriological cultures did not yield any consistent types of bacteria.

Symptomatology.—A severe diarrhea has been observed in nursing pigs one to 24 hours following farrowing. The feces were of a gray to yellow color and contained mucus and gas. The baby pigs became dehydrated, weak, and often refused to nurse within one hour after the first symptoms of diarrhea were noted. In the cases studied, the sows had normal parturitions and no symptoms of illness were observed in any of the sows following parturition. Milk secretions appeared normal in quantity and quality except in 2 sows that developed mastitis. All pigs were affected in the litters showing this type of scours. When no therapeutic measures were taken, all pigs were dead within 60 to 80 hours after symptoms developed.

Where therapeutic measures were delayed for 12 hours or more, many of the pigs survived, but 10 to 30 per cent of them were unthrifty and matured at a rate much slower than normal.

Published with the permission of the director, North Dakota Agricultural Experiment Station, Fargo.

From the Departments of Veterinary Science and Animal Husbandry, North Dakota Agricultural College, Fargo. Preliminary investigation, B.J.O.-124-swine enteritis.

The authors express their sincere appreciation to Mr. Asgar Fog, swine herdsman, for his cooperation in this experiment.

Terramycin utilized in this investigation was in part supplied by Chas. Pfizer & Co., Terre Haute, Ind.

—John Burnham, N. Dak. Exper. Sta.

Fig. 1—The pig on the right is one of a litter treated 72 hours following the onset of enteric symptoms. The pig on the left is from a litter treated within 12 hours following the onset of enteric symptoms. The pigs were farrowed within 12 hours of each other.

Both the North Dakota Agricultural College cases and field cases in this study were in swine droves in which the environmental conditions were good and adequate nutritional rations were fed to the sows.

Therapeutic Approaches at Control.—Therapeutic measures used in an attempt to control this disease have included the injection of either anti-swine erysipelas serum or anti-hog cholera serum or both. These appeared to be of little or no value. The antibiotics, penicillin and streptomycin, injected into the pigs with diarrhea appeared to have little or no value.

In searching for a more efficacious therapeutic agent, oxytetracycline (terramycin®) and chlortetracycline (aureomycin®) were administered orally in 100-mg. capsules to baby pigs weighing 2 to 5 lb.

This therapy was successful only when three or more treatments were given at 12-hour intervals. This procedure involved excessive handling of the pigs and was time-consuming.

Unpublished data collected by the authors indicate that when large doses of several of the antibiotics are given intravenously or intramuscularly, they are eliminated in the milk of the lactating cow. It was assumed that sows would also excrete antibiotics in the milk provided a sufficiently high level was present in the blood. Because intramuscular injections are less difficult to give than intravenous injections, the former method was chosen for this experiment.

Two sows were injected, in the muscles of the ham, with 2 Gm. of terramycin each. The piglets in each litter improved in general condition and the scouring stopped within 12 hours. It was later established that a dose of 1 Gm. was a sufficient quantity to give therapeutic levels in the milk. In all cases, the terramycin for a given dose was dissolved in 20 ml. of distilled water. When 18 additional sows with scouring pigs were treated, all pigs recovered within 12 hours.

The intramuscular injection of 1 to 2 million units of penicillin or 1 to 2 Gm. of streptomycin to a sow with scouring pigs was of no benefit to the pigs. Combinations of penicillin and streptomycin were valueless in correcting the diarrhea.

Two sows with litters showing typical scouring were not treated for 72 hours following the onset of symptoms. The scouring became progressively more severe. The pigs became emaciated and dehydrated and 3 died. Upon necropsy, lesions of a severe gastroenteritis were observed. Intramuscular injection of 1 Gm. of terramycin to the sow partially alleviated the condition within 12 hours. Some of the piglets were so weak that they probably nursed very little and so did not get a therapeutic dose of terramycin.

The intramuscular injection was supplemented in this case by oral administration of the drug to the sow by adding it to the feed at the rate of 4 oz. of terramycin, animal formula,* per feeding for two days. It was later found that the oral administration of terramycin to the dams was of no value in treating the diarrhea of baby pigs.

Summary.—Peracute gastroenteritis of baby pigs characterized by profuse diarrhea has been successfully treated by the intramuscular injection of 1 Gm. of terramycin into the dam.

*Terramycin®, animal formula, soluble powder, 25 Gm. of terramycin hydrochloride activity per pound of feed.

Piperazine, Anthelmintic for Sheep

When piperazine hydrate, diacetate, or carbodithioic betaine, each in 4-Gm. doses, were injected into the rumen of 12 sheep, they were 100 per cent effective against *Oesophagostomum columbianum and Oesophagostomum venulosum,* but had no effect on *Haemonchus contortus* or Trichostrongylus species.

Piperazine hydrate was also ineffective against *Chabertia ovina* when injected into the rumen and against Trichostrongylus and *H. contortus* when injected into the abomasum. An emulsion of piperazine hydrate, combined with carbon tetrachloride, was highly effective against *H. contortus* and *Oe. columbianum* when given by mouth. A combination of copper sulfate, nicotine sulfate, and piperazine hydrate was also effective against these same parasites; however, the latter mixture produced temporary toxic signs.—*Austral. Vet. J., Feb., 1955.*

The swine kidney worm, *Stephanurus dentatus,* formerly believed confined to southern states, is appearing in slaughtered hogs from northern states.—*du Pont Rev. of Livestock Parasitol., July, 1955.*

Observations on Raising "Disease-Free" Swine

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SWINE PRODUCTION has been seriously hampered in recent years by several insidious and costly diseases. Efforts to eliminate these diseases by disposal of infected herds and replacement with suitable breeding stock has not been entirely successful, because often the replacement stock is not completely disease-free. This is apparently due to the wide distribution of these infections and to the lack of suitable diagnostic measures to detect the carrier or infected animal. The various treatments used have not been entirely effective in eliminating disease conditions in these animals. Such infections have often made it difficult to interpret the results of experimental work. In many instances, conclusions have been reached and recommendations made from experimental data when the experimental animals should have been regarded as diseased rather than normal.

In 1950, an attempt to raise disease-free swine was started at this station. Baby pigs were collected by cesarotomy, fed artificial rations, and raised and maintained in an environment entirely isolated from other swine-raising operations. The objectives of this study were: (1) to observe the possibility of eliminating certain disease problems (especially complex chronic digestive disturbances of infectious origin) existing in the parent stock; and (2) to study the effect of various rations during growth, reproduction, and lactation for pigs raised in this manner. A preliminary report of this work was made previously.[13]

Many have studied the fundamental nutrition of the baby pig, using simplified types of diets,[7, 10, 12] and have demonstrated the successful use of artificial rations on pigs a few days of age. However, a high mortality has been reported by McRoberts and Hogan[6] and Bustad *et al.*[1] when artificial rations were fed at birth. The high death rate was assumed to be due, at least in part, to the failure of the baby pig to receive colostrum. Young and Underdahl[14] have reported a practical ration which, when used in conjunction with strict isolation procedures, was successful in raising baby pigs from birth.

Most of the difficulties reported in raising baby pigs on artificial rations are various forms of digestive disturbances. At this station, these disturbances were sometimes not encountered if strict attion was given to the selection of experimental pigs from herds known to be free of in[f ..ious digestive disturbances.

Breeding difficulties at maturity, in pigs raised on simplified or practical artificial rations, have been reported to the authors by several persons. Hogan and Anderson[5] reported failure in reproduction of a sow raised and maintained on a purified type of ration. Russell *et al.*[11] also found that gilts raised on purified rations failed to reproduce.

Reyniers *et al.*[9] have described the technique used and some of the problems involved in raising germ-free albino rats. Many of their procedures would have application in a study with pigs; however, it was not the intent of this experiment to raise germ-free pigs but, rather, to attempt to break the cycle of disease-spread from the sow to the baby pig.

A preliminary trial to this experiment on one litter of baby pigs collected by cesarotomy and raised on an artificial ration was conducted during the fall of 1950.

PROCEDURE

Four purebred Chester White gilts from the Animal Husbandry Department were selected and raised on well-balanced rations with excellent managerial care. However, they had been exposed to a chronic digestive disorder that had been prevalent in the herd for several years. This disturbance was especially troublesome during the late fall and winter but at certain other times it was hardly detectable. The gilts were bred to purebred Chester White boars in the fall of 1950.

Operation.—The cesarotomy was performed a few hours after the "let-down" of milk by these gilts. The operation was conducted according to the technique described by Frank,[2] using local anesthesia and with special precautions given to asepsis. An incision was made in each horn of the uterus and each pig was expelled directly into a sterile cloth bag. The umbilical cord was cut after clamping with a hemostat. The cloth bags containing the baby pigs were placed in a warm box which was then immediately moved to an isolated metabolism room in the animal husbandry building. All of the 15 gilt pigs and 2 boars from each

From the Department of Animal Husbandry, Oklahoma A. & M. College, Stillwater. Published with the approval of the director, Oklahoma Agricultural Experiment Station.

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litter were used in this study. Extra boar pigs were returned to the dam after completion of the operation.

Rations.—The percentage of dry matter composition of the basal ration fed the baby pigs at birth was: vitamin-free casein, 30; fat, 42; lactose, 23; mineral mixture, 5; with a complete synthetic vitamin mixture added. Further details on the composition and preparation of the ration are given by Thompson *et al.*[10] and Reber *et al.*[1] The basal ration was fed to 7 pigs, while for 16 pigs it was supplemented with raw eggs and heifer colostrum as a source of unidentified nutrients. The ration was fed as an artificial milk, using a 20 per cent solids basis, with warm distilled water added and the entire mixture homogenized with a blender just before feeding.

When the pigs were approximately 5 weeks of age, they were moved to new quarters and the above ration was gradually replaced by a basal ration composed of:

Corn	66.0 per cent
Soybean meal	25.0 per cent
Alfalfa leaf meal	5.0 per cent
Dried skim milk solids	2.0 per cent
Brewer's yeast	0.5 per cent
Steamed bone meal	1.0 per cent
Iodized salt	0.5 per cent

When they became accustomed to this ration, the value of antibiotics for pigs raised in this manner was determined by feeding one group of 8 the basal ration while the remaining group of 9 pigs was fed the basal ration supplemented with 10 mg. of crystalline aureomycin® per pound of ration (table 1). On completion of the 28-day antibiotic feeding experiment, all the pigs were fed the basal ration (with slight modifications of the protein levels) until breeding age. The 9 gilts were then divided into two groups, 4 in one group and 5 in the other. One group was fed an all-plant type of basal ration composed of:

Ground yellow corn	75.0 per cent
Soybean meal	18.0 per cent
Ground alfalfa hay	5.0 per cent
Bone meal	1.5 per cent
Iodized salt	0.5 per cent

The other group was fed the same ration with 2 per cent skim milk solids added at the expense of the soybean meal. The gilts were hand-fed their respective rations until their second litters were weaned. Only 3 gilts on each ration were carried through the second reproduction-lactation phase.

General Care of the Baby Pigs.—The pigs were raised in individual metal metabolism cages with false floors. They were fed five times a day the first week and four times a day thereafter. Each feeding consisted of 30 to 100 ml. of the artificial "milk" in shallow rabbit crocks. The amount was gradually increased as needed. The crocks were sterilized in a drying oven after each feeding and the cages were washed at least once daily. The room temperature was maintained at 90 to 95 F. when the pigs were small but was gradually reduced to 70 F.

Management of Mature Stock.—When approximately 5 weeks of age, the pigs were moved to an isolated area at the crest of a hill in a pasture believed never to have previously maintained swine. The equipment used, such as houses, feeders, waterers, and fencing, was either new or previously unused in swine-raising operations. The caretakers were not in contact with other swine-raising operations. The rations were mixed at a local mill and taken directly to this location. A small amount of vegetation was available to the

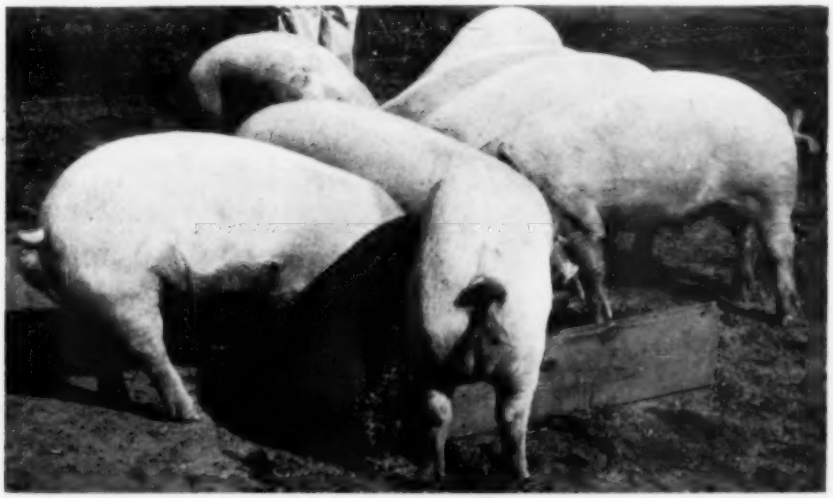

Fig. 1—This group of pigs was raised on artificial rations. Their approximate age is 126 days; weight, 145 lb.

pigs at certain times of the year, but they were essentially maintained in "drylot" conditions. Housing facilities were somewhat limited, especially during farrowing.

RESULTS

Growth.—Of 23 baby pigs that were started on the artificial "milk" rations, 17 were raised. Seven of the 23 pigs were not given any supplement as a source of unidentified nutrients, and 4 of these were raised. All the pigs grew at rate equal to, or surpassing, the average growth rate of pigs raised by sows in the foundation herd. At 32 days of age, the average weight was approximately 15 lb.

Health.—At no time during the experiment was there evidence in any of the animals of diarrhea or disturbances similar to those observed at times in the herd from which the parent stock originated. One baby pig that was raised weighed only 1.1 lb. at birth. The pigs appeared healthy and thrifty (fig. 1). Two boars, slaughtered when about 9 months old, averaged 393 lb. Their entire digestive tracts were examined for parasites. One mature ascarid was found in the intestine of 1 and 3 in the other. It is believed that this infection was acquired *in utero* from the parent stock.[4] Some of these animals were vaccinated for hog cholera and returned to the original herd in the fall of 1952. They were observed for three months but no unusual disturbances were noticed.

TABLE 1—Summary of the Average Growth Rate and Feed Efficiency of Pigs Fed a Basal Ration, and a Basal Ration Plus Aureomycin

Items	Lot 1 basal	Lot 2 basal + aureomycin*
Days on experiment	28.0	28.0
Pigs per lot	8.0	9.0
Ave. initial wt. (lb.)	54.4	50.8
Ave. final wt. (lb.)	93.1	89.4
Ave. daily gain (lb.)	1.41	1.38
Feed per cwt. gain (lb.)	288.0	278.0

*10 mg. of crystalline aureomycin per pound of ration.

Antibiotic Response.—While the feeding of crystalline aureomycin was of short duration and a rather limited number of animals were used, the data indicates (table 1) that aureomycin did not improve growth performance or feed efficiency. In later experiments, however, there has been some growth response to the addition of antibiotics to the rations of progeny raised from these swine. These data resemble those reported by Coates *et al.*[2] who found that chicks, raised in laboratories where birds had never been housed, did not respond to penicillin; whereas, chicks in pens used by poultry for some years showed a response.

Reproduction-Lactation.—The general results during reproduction and lactation are summarized (table 2). In the spring of

Fig. 2—This sow, shown with her first litter, was raised on artificial rations.

TABLE 2—General Reproduction-Lactation Results

	Reproduction-lactation	
	First*	Second†
No. bred	9.0	6.0
No. farrowed	9.0	6.0
Pigs per litter (ave.)	7.6	7.2
Birth wt. (ave. lb.)	2.5	2.5
No. pigs born dead or abnormal	7.0	1.0
Pigs weaned/born (%)	52.0	91.0
Weaning wt. (ave. lb.)	27.2	30.4

*Spring, 1952; †fall, 1952.

1952, a number of pigs were lost at birth. This was believed due to the first 6 gilts farrowing in early March during a blizzard and cold weather, and to crowded farrowing quarters which made it difficult to give the usual amount of care to the baby pigs. There may have also been a deficiency of nutrients, especially unknown factors, in the basal ration. The basal ration fed to one group of these sows was similar to the ration that Ross *et al.*[10] reported as causing poor production, especially various congenital malformations. However, evidence of congenital malformation, shown by 2 pigs from gilts on the all-plant basal ration, also occurred in pigs from sows fed the 2 per cent skim milk solids. In most instances, the pigs were weak at birth and died during the first 12 hours. While some close inbreeding was practiced, it was not believed to be an important cause of the unfavorable reproduction. Lactation results were about average. Individual sows on both rations farrowed and raised normal litters to weaning age (fig. 2).

DISCUSSION

The possibility of establishing swine herds which would have a minimum amount of infection is indicated. Results would probably be improved by planning which would include a more careful selection of foundation stock, eliminating close inbreeding, treating for roundworm infection before breeding, improved equipment and facilities, and the use of better rations especially during reproduction and lactation. This general procedure may have practical application in preserving valuable breeding stock and in establishing disease-free herds for replacement stock. A disease-free herd of swine would also be of value as a source of uniform animals for studies on basic nutrition and metabolism, as well as on immunity and susceptibility. Young *et al.*[15] have reported the value of a similar technique.

Infectious agents, especially those causing various digestive disturbances in swine, have been especially troublesome in many nutrition experiments. Their presence (and virulence) or absence would certainly affect the nutritive requirements. Reber and Whitehair[8] have reported on the losses of some nutrients in pigs exposed to transmissible gastroenteritis infection. Likewise, it is believed that the growth-promoting value of antibiotics for young pigs is due, at least in part, to the control of these infections or the secondary complications resulting from them. Therefore, the term "growth-promoting," when applied to such agents, may be somewhat misleading inasmuch as the growth response is often confined to "runt" pigs or to those suffering from various intestinal infections. Perhaps the response would be more appropriately termed "normal" growth. These "miscellaneous" infections seriously interfere with the practical success of raising baby pigs from an early age on artificial rations.

The roundworm infection observed in this study was of interest. Perhaps further work on the possibilities of *in utero* infection should be carried out. In a complete parasite-control program, gilts perhaps should be treated for worms and placed on clean ground before breeding.

SUMMARY

The general procedure used in attempting to raise a disease-free herd of swine is described. The pigs were collected by cesarotomy and raised on artificial rations. These pigs showed no growth response to antibiotic feeding. Their gains were at least equal to pigs raised on sows in the foundation herd. The animals were maintained in an isolated environment until after weaning their second litters. The possibilities for a herd raised in this manner are discussed.

References

[1]Bustad, L. K., Ham, W. E., and Cunha, T. J.: Preliminary Observations on Using a Synthetic Milk for Raising Pigs from Birth. Arch. Biochem., *17*, (1948): 249-260.

[2]Coates, M. E., Dickinson, C. D., Harrison, G. F., Kon, S. K., Cummins, S. H., and Cuthbertson, W. F. J.: Mode of Action of Antibiotics in Stimulating Growth of Chicks. Nature, *168*, (1951): 332.

[3]Frank, E. R.: Veterinary Surgery Notes. Burgess Publishing Co., Minneapolis (1945): 165-167.

[4]Herrick, C. A.: Personal communication.

[5]Hogan, A. G., and Anderson, G. C.: Vitamins

Required by Swine for Growth, with Some Observations on Reproduction. J. Nutr., *36,* (1948): 437-449.

[6]McRoberts, V. F., and Hogan, A. G.: Adequacy of Simplified Diets for the Pig. J. Nutr., *28,* (1944): 165-174.

[7]Reber, E., Whitehair, C. K., and MacVicar, R. W.: The Effect of Level of Protein Fed Baby Pigs. J. Nutr., *50,* (1953): 451-458.

[8]Reber, E. F., and Whitehair, C. K.: The Effect of Transmissible Gastroenteritis on the Metabolism of Baby Pigs. Am. J. Vet. Res., *16,* (1954): 116-119.

[9]Reyniers, J. A., Trexler, P. C., and Ervin, R. F.: Rearing Germ-Free Albino Rats. Lobund Rpt. No. 1, Labs of Bact., Univ. of Notre Dame, Notre Dame, Ind., 1946.

[10]Ross, O. B., Phillips, P. H., Bohstedt, G., and Cunha, T. J.: Congenital Malformations, Syndactylism, Talipes and Paralysis Agitans of Nutritional Origin in Swine. J. Anim. Sci., *3,* (1944): 406-414.

[11]Russell, W. C., Teeri, A. E., Unna, K.: Growth and Reproduction of Swine on a Purified Diet. J. Nutr., *35,* (1948): 321-332.

[12]Thompson, C. M., Reber, E., Whitehair, C. K., and MacVicar, R. W.: Utilization of D-Tryptophan by Swine. J. Anim. Sci., *11,* (1952): 712-720.

[13]Thompson, C. M., Whitehair, C. K., MacVicar, R. W., and Hillier, J. C.: Observations on Artificially Raising Healthy Swine. Oklahoma Agric. Exper. Sta. MP-27, (1952): 74-77.

[14]Young, G. A., Jr., and Underdahl, N. R.: A Diet and Technique for Starting Pigs Without Colostrum. Arch. Biochem. and Biophysics, *32,* (1951): 449-450.

[15]Young, G. A., Underdahl, N. R., and Hinz, R. W.: Procurement of Baby Pigs by Hysterectomy. Am. J. Vet. Res., *16,* (1954): 123-131.

The U. S. Livestock Sanitary Association Meeting—1955*

ANTHRAX IN 1955

During the first nine months of the year, 217 cases of anthrax were reported in 19 states, including 84 in Louisiana, 27 in South Dakota, and 20 in Texas and California. The 217 consisted of 194 cattle, 11 hogs, and 12 horses or mules, with 68 per cent reported in the third quarter. New York reported 5 cases, the first in 25 years. —*C. D. Stein, Washington, D. C.*

SEROLOGICAL TEST FOR ANAPLASMOSIS

The complement-fixation test for bovine anaplasmosis has been shown to be 96 per cent accurate. To determine its specificity, serums were tested from 4 cows with brucellosis, 6 with vibriosis, and 2 which had recovered from vesicular stomatitis; all were negative for anaplasmosis. There was no suggestion of cross reaction.—*D. W. Gates, Beltsville, Md.*

BOVINE TUBERCULOSIS

Tuberculosis Eradication in the United States.—During the past fiscal year, more cattle were tested for tuberculosis than for many years. There were approximately 11,000 reactors or 0.12 per cent, a slight rise from recent years. An increased effort has been made to trace the origin of animals which are found infected when slaughtered. This is often impossible since approximately one fourth of the cattle killed are not inspected and another fourth lose their identification when their hides are removed before being inspected.—*A. F. Ranney, Washington, D.C.*

Tuberculosis Eradication in Canada.—Of Canada's 9.5 million cattle, about 87 per cent have been tested at least once. Of the 2 million tested last year, 8,947 (0.19%) reacted. A given area is accredited for three years if less than 0.5 per cent react and for six years if less than 0.2 per cent react. When more than 0.5 per cent react, the entire area is retested until the incidence of the disease is reduced. The infection is steadily dropping.—*K. F. Wells, Ottawa, Ont.*

Report of the Committee on Tuberculosis.—The intradermal cervical test for tuberculosis can be repeated in two weeks if the injection is made at a point at least 4 inches from previously injected sites. A strictly range area is accredited when all dairy and purebred herds, and the home cattle in semirange herds, have been tested and less than 0.5 per cent have reacted. If any reactors are found, the entire herd must be tested. If no lesions, or only skin lesions, are found when the reactors are slaughtered, the accredited status of the herd is not affected.—*H. A. Milo, Harrisburg, Pa.*

JOHNE'S DISEASE

Gross lesions of Johne's disease are not diagnostic without bacteriological confirmation. An improved johnin, a dry powder which is mixed with a diluent just before used, is still not satisfactory, but serological tests tried in England are no more accurate. The best method for control is to ra-

*See pages 32, 33 in the Jan. 1, 1956, JOURNAL for report of other diseases discussed at the U. S. Livestock Sanitary Association meeting.

move calves from their dams immediately after birth and raise them in uncontaminated quarters.—*A. B. Arson, Auburn, Ala.*

SEROLOGICAL MILK TEST FOR BRUCELLOSIS

A milk whey test for diagnosis of brucellosis in the udder seems to be as efficient as the blood serum test. With the whey test, cows vaccinated with strain 19 vaccine usually stop reacting in about nine weeks so this test may eventually be used to differentiate vaccinated from infected cows. Of 1,889 cows which were negative to both blood and whey tests, 2 were found to shed Brucella in their milk; of 169 positive to both tests, 135 were shedders; of 31 that were positive on blood tests but negative on whey tests, none were shedders; and of 108 which were negative on blood tests but positive on whey tests, 25 were shedders.—*H. S. Cameron, Davis, Calif.*

CHLOROHEXADINE, A NEW DISINFECTANT

Chlorohexadine (novosan) is twice as effective against common bacteria as quaternary ammonium compounds and four times as effective as hypochlorites. It has the further advantage that it can be used extensively without causing the hands to chap.—*G. T. Edds, Fort Dodge, Iowa.*

COMMITTEE ON HOG CHOLERA ERADICATION

The committee believes that hog cholera can be eradicated from the United States. It recommends that pilot test areas be continued in the Southeast, with consideration being given to including nonliving vaccines. It suggests also that a true control area, with no vaccination, be established with means available for checking cholera should it occur. Sales of hog cholera biological agents in the United States were approximately as follows: anti-hog cholera serum—1,762 million cc. in the fiscal year 1951, 897 million cc. in 1955; simultaneous virus—106 million cc. in 1951, 34 million cc. in 1955; inactivated hog cholera vaccines—7 million doses in 1951, 2.5 million doses in 1955; modified vaccines—4 million doses in 1952, 29 million doses in 1955. Number of swine vaccinated (est.) 50.5 million in 1951, 46.7 million in 1955.

It is recommended that the cooking of garbage be maintained for the control of hog cholera as well as other swine diseases. —*S. H. McNutt, Madison, Wis., Chairman.*

SWINE DISEASE CONTROL IN INDIANA

In the spring of 1955, the Indiana Swine Breeders Association, working with the State Livestock Sanitary Board, set up the Indiana Swine Health Council with Dr. E. E. Slatter (OSU '30) as full-time director of its swine disease control program. This program is of, by, and for the swine producers. To participate, breeders must enroll in the swine brucellosis eradication progam. The success of the project will depend on participation of all purebred breeders.—*R. H. Waltz, Indianapolis, Ind.*

LEPTOSPIROSIS IN SWINE

Leptospirosis in swine is often subclinical until abortions occur. Many of the pigs are born weak or they die a few days or weeks later. The infection tends to localize in the kidneys where it is spread in the urine. Streptomycin is the most effective agent for destroying localized infection.—*L. C. Ferguson, Wooster, Ohio.*

ATOMIC FALLOUT AND ITS EFFECTS

Fallout from atomic detonations in the United States has not been a hazard to the health of livestock although skin lesions (*beta* burns) due to the nonlethal *beta-gamma* rays have occurred in pastures adjoining areas where bombs have been tested. However, super bombs, because of *gamma* radiation, would be a hazard in an area of several thousand square miles. They would cause blood dyscrasias, loss of weight, and death. Genetic mutations due to radiation are of little importance in animals. The danger of inhaled or ingested radioactive material is not great. Even the flesh of animals exposed to lethal doses of *gamma* radiation may be safely eaten if they contain less than the maximum permissible level of radioactivity. If they contain more, perishable foods can not be used but nonperishable foods can be set aside until the level is decreased by natural radio decay.—*Lt. Col. B. F. Trum, Oak Ridge, Tenn.*

A Test of Cow's Milk for Q Fever.—A capillary tube agglutination test for detecting antibody against *Coxiella burnetii* in bovine serums has been adapted for use on milk. When tested on 678 cows, it was as reliable as the test on serum or as the complement-fixation test.—*J.Am.M.A., July 2, 1955.*

Nutrition

Stilbestrol Feeding to Lambs

Feeding 2 mg. of diethylstilbestrol per wether lamb per day at Iowa State College increased the gains approximately 22 per cent, without increasing feed consumption and with little or no effect upon carcass quality. Higher levels (3.6 mg.) resulted in smaller gain and a decrease in carcass quality. Moderate enlargement of the prepuce, mammary development, and edema of the anal area were evident but much less so than with stilbestrol implants.—*J. Anim. Sci., Nov., 1955.*

Raising Heifers on Alfalfa Hay

Dairy heifers made satisfactory growth, when fed only high-quality alfalfa hay as forage with less than 500 lb. of grain, from birth to their first calving. Gains were better on the alfalfa as hay than as silage. Milk feeding was discontinued at 60 days and grain feeding at 8 months of age.—*U.S.D.A.*

Vitamin E-Deficient Swine

Vitamin E has not been considered of importance in swine production in the United States, but in northern Europe liver damage and sudden death apparently result from a high intake of fish scrap and cod-liver oil as stress factors. The condition was experimentally reproduced on low protein diets containing cod-liver oil and was prevented by supplementary feeding of *alpha*-tocopherol. The condition resembled the so-called "moldy corn" disease of swine in the South, where corn is often fumigated with chlorinated hydrocarbons which are detrimental to vitamin E.—*Am. Feed. Mfr. A. Abstr., Sept., 1955.*

Vitamin E and Turkey Reproduction

Addition of *alpha*-tocopherol acetate to an all-vegetable protein diet at a rate of 20 mg. per pound of feed increased the hatchability (not egg production or fertility) of turkey eggs from 51.7 to 88.0 per cent over a nine-week period. When this vitamin E was then removed, hatchability decreased 9.3 per cent in the following eight weeks. Dried whey and fish-soluble supplements had no effect on hatchability. The peak of embryonic mortality in eggs from birds without vitamin supplement was in the last four of the 28-day incubation period. These embryos appeared blind with a cloudy lens or cornea and the embryos were smaller than normal.—*J. Nutr., March, 1955.*

Feeding Animal Fat to Dairy Cows

Animal fats were fed to dairy cows at the University of Illinois at rates as high as 8.5 per cent of the grain mixture or 2 lb. of fat per head daily. After a day or two, the cows ate the mixture readily with no apparent abnormal physiological effects, no change in the milk yield, and no effect on the composition of the butterfat. However, these fats can be fed economically only when they can be purchased at less than 2.5 times the cost of grain.—*Hoard's Dairyman, Sept. 25, 1955.*

Effect of Particle Size of Minerals.—In two feeding trials at the Nebraska Agricultural Experiment Station, coarse and fine-textured limestone and bone meal were found to be of equal value as mineral supplements for growing beef cattle.—*J. Anim. Sci., Nov., 1955.*

Effect of Hormones on Swine Growth

Neither testosterone (20 mg. per day) nor diethylstilbestrol (2 mg. per day), with or without terramycin,® improved the growth rate or feed efficiency of pigs in drylot at Purdue University. Stilbestrol produced mammary stimulation in both sexes and enlargement of the vulva in females. Testosterone produced some masculine characteristics.—*J. Anim. Sci., May, 1955.*

Arasan-Treated Corn Is Poisonous

When arasan-treated seed corn makes up 5 per cent of a poultry ration, it can stop the growth of young birds or egg production in hens. At 7 p.p.m., egg production drops somewhat; at 37 p.p.m., it drops greatly and half the eggs may be odd-shaped; at 150 p.p.m., the few eggs may be soft-shelled. Fully treated seed corn contains 600 to 750 p.p.m.—*Hoard's Dairyman, Sept. 25, 1955.*

Producing what the Consumer Wants

Producing what the consumer wants is a basic principle of a successful enterprise. A marked shift in the amount of disposable income spent for an essential commodity should serve as a warning sign that the public is not happy with the product which is offered to them.

The pork markets present a classic example.

Hog production in the United States, historically, has been largely a process of converting corn into pork with little attention being paid to the important question of producing a type of product that would continue to hold its position with respect to consumer demand for meat. As a result, for the past nine years consumers have continued to spend approximately 2.8 per cent of their disposable income for beef, whereas their spending for pork has shown a steady downward trend: from 3.0 per cent in 1947 to 2.0 per cent in 1955. That the fatness of pork has been a factor in this trend is indicated by the prolonged decline in the price of the fatter cuts as compared with the leaner ones.

Past efforts to improve meat quality by shifting from the "lard" type to the slower-growing, "bacon"-type hogs was not rewarded by selective buying and compensatory prices on the market.

Bacon breeds are used in the establishment of new meat-type breeds and as foundation stock for the now quite extensive hybrid swine-breeding programs. The established American breeds also have been improved by selection. However, as yet only about 15 per cent of the hogs marketed can be classified as of the meat type. Possibly, to improve their position in the markets, the type change may have to be more drastic than the present goals.

Fortunately, a shift in type can be accomplished much more rapidly in hogs than in any other species of livestock, but in this instance it has been too slow. In the meantime, producers often avoid price discrimination against fatness by marketing their hogs at lower weights.

Programs aimed at increasing pork's popularity with housewives should receive the immediate support of all who have a stake in agriculture's prosperity.

Of interest is the action of the American Meat Institute in setting aside a million dollars to spend on pork sales promotion over the next six months, and their recommendation to the meat-packing industry that they trim more of the external fat from various pork cuts before sending them into wholesale and retail channels.

This program will do much to help keep pork products moving to consumers without having to resort to substantial price reductions. It would seem, however, that very little improvement in live hog prices can be expected until swine growers successfully meet the challenge of more closely producing the product that the consumer wants.

The Distressed Hog Market

The "1956 Outlook Issue" of the U.S.D.A. "Livestock and Meat Situation" report points up some interesting facts regarding the production and consumption of meat during the past few years.

Production of the red meats has increased steadily from 21.9 billion lb. in 1951 to about 26.8 billion lb. in 1955. Nearly all of this 22 per cent increase in meat is beef, the 13.6 billion lb. in 1955 being the largest on record. Pork production, after dropping from 11.4 billion lb. in 1951, also increased sharply from 9.9 to 10.9 billion lb. in the past year.

Pork has long been known as the poor man's meat so, with prosperity high and beef plentiful, it should surprise no one that consumers' long-established preference for beef should now be more evident than usual.

Therefore, we can not subscribe to the philosophy expressed in the "News Comment" in the December, 1955, issue of *Veterinary Medicine* entitled "Influence of Disease Epidemics" in which it was claimed that the present low prices paid to growers of market swine was "an example of consumer reaction to publicity given vesicular exanthema . . . , garbage-cooking regulations . . . , and incidence of trichinosis in pork from garbage-fed animals."

Garbage-cooking and associated disease control programs can be pointed to as factors which contribute to increased swine production, thus contributing to lower prices paid for swine, but by no stretch of the imagination can it be inferred that these factors have significantly affected consumer demands.—H.E.K., JR.

Current Literature

ABSTRACTS

Modified Virus of Venezuelan Equine Encephalomyelitis

The virus of Venezuelan equine encephalomyelitis (VEE), a highly pathogenic agent by intraperitoneal and intracerebral routes of inoculation and with a wide host range, has been attenuated by serial passage in HeLa cell tissue cultures. Beginning with the twenty-third passage, an alteration of pathogenicity for mice was demonstrated by comparing $l.d._{50}$ titers between the intracerebral and intraperitoneal routes. Older mice were refractive to the attenuated virus injected intraperitoneally and virulence was reduced in later passages for mice 14 days of age. Loss of virulence for the rabbit and guinea pig occurred.

Guinea pigs withstood challenge doses of virulent VEE after intradermal immunization with live HeLa modified VEE virus.—[*L. C. Murphy, V. L. Blackford, and C. A. Gleiser: Study of the Properties of the Virus of Venezuelan Equine Encephalomyelitis Modified by in Vitro Cultivation in HeLa Cells. Am. J. Vet. Res., 16, (Oct., 1955): 521-524.*]

Vesicular Stomatitis in a Laboratory Worker

A professional worker (F.W.) became ill after infecting steers with the New Jersey type of vesicular stomatitis (VS) virus. Blood and nasopharyngeal specimens were inoculated into embryonating chicken eggs and Swiss mice. An infectious agent was isolated from embryos inoculated with blood. When tested in a neutralization test in embryonating eggs, the virus was neutralized by known New Jersey type of guinea pig hyperimmune serum and by the third and fourth samples of F.W. serum collected 14 and 80 days, respectively, after infection. The isolated agent induced vesiculation of bovine tongue epithelium and the pads of guinea pig feet in a manner resembling VS virus. Various tests proved the F.W. agent to be indistinguishable from the New Jersey type of VS virus. It is believed that this is the first isolation of VS virus from the blood of man.—[*O. N. Fellowes, G. T. Dimopoullos, and J. J. Callis: Isolation of Vesicular Stomatitis Virus from an Infected Laboratory Worker. Am. J. Vet. Res., 16, (Oct., 1955): 623-626.*]

Isolation of Toxoplasma from Milk, Placentas, and Pigs of Carrier Sows

Toxoplasma gondii was isolated from 2 pigs collected aseptically from the vagina, as well as from the milk and the heart, of a naturally infected sow which was consistently asymptomatic. Toxoplasma organisms were isolated from the milk and from 3 of 4 pigs from a second apparently healthy, naturally infected sow. Thus pregnant, apparently healthy sows carrying Toxoplasma organisms transmitted the infection to their pigs *in utero*. Furthermore, the protozoon was carried in edible portions of the carcass.

Toxoplasma gondii was isolated from the milk at the time of parturition of 2 naturally infected sows and from the milk of 1 experimentally infected gilt. The organism was present in the placentas from 2 of 3 experimentally infected gilts. Inoculation of gilts late in gestation (84th to 108th day) did not result in congenital infection in their pigs.—[*V. L. Sanger and C. R. Cole: Toxoplasmosis. VI. Isolation of Toxoplasma from Milk, Placentas, and Newborn Pigs of Asymptomatic Carrier Sows. Am. J. Vet. Res., 16, (Oct., 1955): 536-539.*]

Influenza in Midwestern Swine

This paper presents data from a study of influenza in swine from 1949 to 1953. More than 2,000 swine serums were tested for presence of hemagglutination-inhibition (HI) or serum-neutralization (SN) antibodies or both as produced by natural infections or by injection of formolized polyvalent influenza vaccine.

The HI test was found useful to indicate previous infection when swine influenza, strain S-15, and type A human influenza, strain PR-8, antigens were used. False positives, as judged by SN tests, were obtained with other antigens.

Vaccination of dams, before breeding, with formolized polyvalent influenza vaccine did not reduce mortalities among suckling pigs farrowed by these dams. This was attributed to lack of occurrence of influenza in young pigs within the herds vaccinated rather than to the inability of the vaccine to produce antibodies.

Incidence of respiratory diseases among swine is discussed with consideration given to causes other than influenza.—[*George A. Young and Norman R. Underdahl: An Evaluation of Influenza in Midwestern Swine. Am. J. Vet. Res., 16, (Oct., 1955): 545-552.*]

Immune Response of Chickens to Inactivated Newcastle Disease Vaccines

The degree of immunity induced among groups of chickens vaccinated with three types of inactivated Newcastle disease vaccines was compared. The types of vaccine were: (*a*) two formalin-inactivated vaccines in which alumina gel was used as the adjuvant; (*b*) a crystal violet vaccine in which ethylene glycol was incorporated; and (*c*) two vaccines in which mineral oil was the adjuvant used. One comparison was made following a single dose and another following two doses given three months apart. Challenge results of the once-vaccinated birds indicated no significant difference between the types of vaccine, except that the percentage of chickens resistant in the group vaccinated with one of the alumina gel vaccines was significantly lower than for the other four vac-

cines. Of the twice-vaccinated groups, those receiving crystal violet vaccine had a significantly greater percentage of resistant chickens (86.5) than was found in groups vaccinated with either the alumina gel vaccines (63.2 and 60.5) or the formalin-inactivated, mineral oil vaccine (60.0). There was no significant difference, however, between the percentage of resistant birds in the group that received the crystal violet vaccine (86.5) and the group that received the ultraviolet-inactivated, mineral oil vaccine (78.8). The hemagglutination-inhibition antibody titer of the serums from twice-vaccinated chickens in the latter two groups were greater than the antibody titer of serums from the other groups.—[*M. S. Hofstad: The Immune Response in Chickens Following the Use of Three Different Types of Inactivated Newcastle Disease Vaccine. Am. J. Vet. Res., 16, (Oct., 1955): 608-612.*]

FOREIGN ABSTRACTS

Hereditary Immunity to Foot-and-Mouth Disease

The authors believe that calves from cows which have a strong immunity to foot-and-mouth disease have a general immunity which remains until the second month of life. They advise against vaccinating calves during these two months during the period of passive immunity or, alternatively, to vaccinate with a bigger dose than that normally used.—[*Maglione and Ragni: Contributo allo studio dell' Eredo-Immunita nell, Afta Epizootica. Zooprofilassi, 5, (May, 1955): 267-279.*]—ANTHONY SUNARA.

Plasmodium Infection in Penguins

During the past seven years, several protozoon infections of penguins have been studied. In all cases observed in Antwerp, *Plasmodium relictum* has been demonstrated. This organism is readily transmitted by the mosquito, *Culex pipiens*. Canaries infected with *P. relictum* develop a mild reaction and the organism may be recovered from their blood for several days.

In the penguin, *P. relictum* extracellular schizontes occur in large numbers.—[*J. Rodhan: Plasmodium Infections of Penguins. Bull. Roy. Soc. Zool. (Antwerp), 1, 1953.*]—J.P.S.

Leptospirosis in New Zealand

Infection with *Leptospira pomona* is common in dairy herds in New Zealand. Infection with *Leptospira byos* also occurs. Calves 3 to 6 weeks old are frequently affected and the mortality in this group is high. It has been suggested that vaccination be practiced regularly in districts where the disease is enzootic.

Vaccination of pregnant cows protected the calves against challenge with virulent *L. pomona* culture when they were 3 to 6 weeks of age.—[*R. M. Salisbury and N. R. McDonald: Leptospirosis of Animals in New Zealand. 23rd Session, Off. Internat. Epizoot., 44, (1955): 132-141.*]—J.P.S.

Blood Transfusions for Bovine Anemia

The rapid destruction of red blood cells in cattle with anaplasmosis may reduce the number to 1,000,000 or less per cubic millimeter, which results in true asphyxia of the tissues. A blood transfusion from healthy animals supplies oxygen-carrying red blood cells as well as the other protective materials from the blood. This hastens the recovery of the sick animal. The blood transfusion also assists in combating the severe dehydration associated with anaplasmosis.

In the cases reported, strict asepsis was followed in obtaining and transfusing the blood. An anticoagulant (sodium citrate, 3%) 10 cc./90 cc. of blood, was mixed during the collection process. An equal quantity of sterile 50 per cent glucose solution and sulfathiazole, at a level of 2 per cent, to prevent contamination, was sometimes added. The preserved blood, held at 35 to 40 F., was stable for ten days. About 10 cc. of blood per kilogram of body weight was given twice daily when considered necessary. Blood transfusions are also of value in other diseases of cattle.—[*Paul Castro: Treatment of Anemia Caused by Anaplasmosis of Cattle with Blood Transfusions. Rev. de Agric. y Ganaderia, 15, (July, 1953): 31.*]—G.T.E.

Visceral Leishmaniasis in Dogs

The anatomical and histological lesions in 5 dogs with leishmaniasis (in Bologna, Italy) are described. The entire endothelium of the reticulum was involved. The lesions of the skin were thought to be particularly important from the viewpoint of transmissibility to man. The author showed how the flea, *Ctenocephalus canis*, was responsible for transmission among dogs. He also describes the schizogonic phases of the parasite.—[*Giuseppe de Domizio: Cazi Mortali di Leishmaniosi Viscerale Canina Autoctona in Bologna. Contributo allo Studio anatomo-patalogico e Parazitologico. Zooprofilassi, 7, (July, 1955): 399-413.*]—ANTHONY SUNARA.

Control of Trypanosomiasis with Drugs

Of the many drugs specified for the control of trypanosomiasis, only three—moranyl (205 B or 309 F), dimidium bromide C chloride, and antrycide—seem to afford some protection.

Only a combination of (*a*) elimination of the tsetse fly by improved sanitary conditions and by use of insecticides, (*b*) chemical prophylaxis, and (*c*) selection of resistant races (e.g., the IV 'Dama bovine) will make it possible to eradicate this scourge.—[*P. Mornet: Chemotherapeutic Prophylaxis of Trypanosomiasis. 23rd Session, Off. internat. Epizoot., 44, (1955): 68-82.*]—J.P.S.

BOOKS AND REPORTS

Diseases of Wild Mammals and Birds

This bibliography of references to diseases covers those of all birds and all wild animals except rabbits and hamsters, which are covered elsewhere, and rats, the references to which were too voluminous to include.

The author is staff veterinarian at the Staten Island Zoo, Staten Island, N. Y. She compiled the approximately 18,000 references, during the past ten years, from more than 900 publications covering a period of 120 years, 1830 to 1950.

It is arranged according to the classification of the species and the listing of the diseases is adapted from the "Standard Nomenclature of Disease." It is a monumental work.—[*A Bibliography of References to Diseases of Wild Mammals and Birds. By Patricia O'Connor Halloran (Part 2 of the October, 1955, issue of the American Journal of Veterinary Research). Published by the American Veterinary Medical Association, 600 S. Michigan Ave., Chicago 5, Ill. 465 pages. Price $10.00.*]—W.A.A.

Atlas for Applied Veterinary Anatomy

This well-illustrated Atlas was prepared as a guide for courses in applied anatomy during the student's clinical years when he more fully appreciates the value of a need for such knowledge. It contains about 150 illustrations of the more clinically important regions. Most of the illustrations are excellent schematic drawings or photographs of well-prepared specimens. The balance are photographs of rough dissections which, although unlabeled, should be adequate for this purpose.

The description is limited since this atlas is expected to be used with other standard texts and with dissected material. There is little to criticize in the technical material but apparently less attention has been given to the legends. There are a few poorly chosen terms such as "stud" for stallion, "caudal-lateral" for caudolateral and, occasionally, the word "bovine" is used where it would have been more consistent and accurate to always use the term "ox" which has long been accepted, especially by anatomists, to designate an adult of unidentified sex of the bovine species. Perhaps the most inaccurate item is in figure 16 where a sketch of the incisor teeth of the ox labeled "approximately 5 years" might better have been "approximately 4 years."

The Atlas deals with six species of mammals plus chickens, and gives the topographic anatomy of the regions where nerve blocks are commonly used, or where palpation or surgery are commonly performed. It is an excellent text which has value for clinicians and surgeons as well as advanced students.—[*Atlas for Applied Veterinary Anatomy. By Robert Getty. 227 pages. Burgess Publishing Co., 426 South Sixth St., Minneapolis 15, Minn. 1955. Price $6.50.*]—W.A.A.

The Merck Veterinary Manual

This handy-sized first edition of the "Merck Veterinary Manual" provides concise and easily available information on diagnosis and treatment of the diseases of the animals which are kept by man. More than 200 contributors cooperated in its preparation. It is remarkably comprehensive even to the inclusion of many nutritional and surgical diseases. The editors have made a considerable effort to make it as complete, accurate, and up-to-date as possible. Neverthless, a few items of commonly repeated misinformation have been included.—[*The Merck Veterinary Manual. O. H. Seigmund, editor in chief. 1,385 pages. Published by Merck and Co., Inc., Rahway, N. J. 1955. Price about $7.00.*]—W.A.A.

A Source-Book of Biological Names and Terms

This text contains many thousands of word elements or combining forms from which scientific names are made. By combining these word elements more than a million words have been formed and used in biological treatises.—[*A Source-Book of Biological Names and Terms. By Edmund C. Jaeger. 317 pages. 3rd ed. Charles C. Thomas, Springfield, Ill. 1955. Price $5.75.*]—W.A.A.

Annual Review of Biochemistry

This twenty-fourth volume of a review of biochemistry, which was first produced in 1931, consists of 21 chapters on subjects ranging from the biological oxidations and various phases of nutrition to the biochemistry of steroid hormones, of antibiotics, and of cancer. It is highly technical and would be of interest only to specialists in this field.—[*Annual Review of Biochemistry. J. Murray Luck, chief editor. 730 pages. Annual Reviews, Inc., Stanford, Calif. 1955. Price $7.00.*]

Annual Review of Microbiology

This ninth volume of the "Annual Review of Microbiology" contains 16 chapters by various authors on such subjects as taxonomy, morphology of viruses, nutrition or metabolism of microorganisms, antibiotics, and resistance of bacterial spores. One of the most interesting chapters to veterinarians is that on immunization. The discussions are highly technical.—[*Annual Review of Microbiology. 426 pages. 1955. Annual Reviews, Inc., Stanford, Calif. Price $7.00.*]—W.A.A.

The World of Bees

This handy little text gives a glimpse of bees in all their intriguing diversity of habit and behavior, touching upon the discoveries of recent years about these interesting insects.—[*The World of Bees. By Gilbert Nixon. 214 pages. Philosophical Library, Inc., 15 East 40th Street, New York 16, N. Y. Price $4.75.*]—W.A.A.

Motion Picture Films

Reviews of films available from the AVMA film library have appeared in previous issues of the JOURNAL (April, 1955: 325-332 and Jan. 1, 1956: 46-48).

A large number of films on subjects related to veterinary medicine are available from other sources. The following films have been reviewed by the AVMA Committee on Motion Pictures. The reviews and other pertinent data concerning these films are published herewith. Reprints will be available on request.

Motion Pictures Available from Other Sources

Bringing up Your Puppy

	Color;		Available from Gaines Dog
16 mm.	Running time	Produced by United	Research Center, 250 Park
Sound	20 min.	Specialists	Ave., New York 17, N.Y.

This film is designed to help dog owners train their pets to become good members of the family. The opening pictures review briefly the general role of domestic animals and point out that they can and must be trained. There is a brief review of the uses man has made of his friend, the dog, and also some pictures of dog-training schools and shows. All of the pictures are exceptional and the narration by Lowell Thomas and Helen Hayes is, of course, excellently done.

The corrective training advice is concerned with barking, jumping, and chasing cars. How to train a dog to heel, stay, sit, and come on command; the dangers of teasing the young puppy, of inconsistency, or delayed punishment in training; and of irregular feeding are all shown.

A short section on the dog's health advises the dog owner to take the temperature of his animal if it does not appear to be normal. If the temperature is high, they are advised to take the dog to a veterinarian. One health tip that will not be generally accepted is that of cleaning ears with alcohol-soaked swabs. But, in general, the advice is constructive and worthwhile.

This film will be of interest to all dog owners and prospective dog owners. Veterinarians will benefit from some of the tips revealed by the picture which they can use in counseling with clients. The film, though rather long, moves along and will be well received.

Every Dog a Gentleman

	Black and white;		Available from Gaines Dog
16 mm.	Running time		Research Center, 250 Park
Sound	13 min.	Produced by John A. Haeseler	Ave., New York 17, N.Y.

This film renders a worthwhile service to dogs as well as their owners, because it stresses simplicity in early training and does not mislead new owners into trying to be overbearing taskmasters. The theme of the film is illustrated by the narrator's statements: "Simple training makes the difference between a well-behaved dog and a nuisance," and "any breed of dog can be trained to be a gentleman—or a lady."

To heel, stay, sit up, and other elementary points in training are portrayed as well as the more advanced acts of carrying and retrieving. Instruction is given in use of hand signals.

This film can be recommended for showing before any group interested in dogs, and would be especially appropriate for showing to groups interested in obedience training.

Greentree Thoroughbred (Long Version No. 2)

	Color;		Available from Movies USA, Inc.,
16 mm.	Running time	Produced by	729 Seventh Ave.,
Sound	31 min.	Bernard Livingston	New York 19, N.Y.

The purpose of this film is to show the great labor and intensive efforts needed to produce Thoroughbred race horses. Raising, development, and training of the Thoroughbred is treated in detail. The film stresses the importance of teamwork between the farm hand, trainer, riders, grooms, and the veterinarian.

The film begins with the introduction of several famous race horses. Background information of each horse includes such facts as by whom the horse was sired and its racing achievements.

Of special interest to veterinary groups is that part of the film which illustrates the technique of using a teaser to determine if the brood mare is in estrus and the proper methods of breeding, emphasizing that a well-run stud can result in a conception rate of as high as 85 per cent.

The birth of a colt is shown and is especially highlighted by the color in the film. The remainder of the film is devoted to the portrayal of the expert care that is required to produce a top race horse. The film should prove of much interest to veterinary students and professional audiences. It is not suitable for lay audiences, and is not cleared for television.

Hog Cholera Control—The Story of Rovac

16 mm.	Color;	Produced by Fordel	Available from Lederle
Sound	Running time	Films Inc., New York	Laboratories, Pearl River,
	25 min.	52, N.Y.	N. Y.

This film is intended to show the dangerous nature of hog cholera and how it can be prevented by the use of rovac® vaccine.

As an advertisement for a specified product, this film is relatively free of objectionable features. It is educational, practical, and pleasingly presented. Technically, it invites one major criticism. Part of the vaccinating is being done by an individual who is walking in the swine pen without boots or other footwear which can be readily washed as he leaves. Also, the vaccine is injected in the ham with no pretense at cleansing the skin with any type of a swab. We hope this individual was not supposed to represent the veterinary profession.

Because of the objectionable features mentioned above, this film can not be recommended for professional or lay audiences.

Intestinal Diseases in Poultry

16 mm.	Color;	Produced by Fordel	Available from Lederle
Sound	Running time	Films Inc., New York	Laboratories, Pearl
	9 min.	52, N.Y.	River, N.Y.

This short film is designed to show certain intestinal diseases of poultry and to describe methods of treating and controlling them.

It is strictly an advertising film and is not recommended for professional or lay audiences.

Livestock Pest Control

16 mm.	Color;	Produced by Everett Ingraham	Available from California
Sound	Running time	Productions, San Francisco,	Spray-Chemical Corp.,
	25 min.	Calif.	Richmond, Calif.

This film depicts the story of many external parasites of farm animals and tells the economic importance of each. Veterinarians will find it an interesting presentation of the modern methods of controlling such parasites as the heel fly (warbles), scabies, and other mites, ticks, screwworms, flies, and other pests.

The final five minutes gives information about the products which the company produces for the control of pests.

It is recommended for professional and lay audiences.

Lungworm Disease of Cattle

	Color;	Produced by, and available from, Regional Animal Disease
16 mm.	Running time	Laboratory, ARS, U.S.D.A.,
Silent	10 min.	Auburn, Ala.

The life history of the lungworm, *Dictyocaulus viviparus* is depicted in this film. The parasite is shown in a Petri dish of saline solution and also it occurs in the lung of the infected animal. These latter views show the pneumonia caused by the worm. Photomicrographs are also shown. Calves infected with the cattle lungworm reveal the symptoms as they are

likely to be seen by the veterinarian in the field. Control measures are outlined in order to complete the picture. Since there is no effective treatment for lungworm, none is mentioned.

The film is of interest to veterinarians and some lay groups, such as cattle owners. It is also recommended for veterinary students.

Pharmacology of Respiratory Stimulants (Coramine)

16 mm. Sound	Black and white; Running time 40 min.	Produced by Audio Productions, Inc., for Ciba Pharmaceutical Products, Inc.	Available from Goshen Laboratories, Inc., Goshen, N.Y.

The physiology and the nervous control of respiration is reviewed in the first part of this film. There are some excellent photomicrographs in this section. Some of the other factors controlling respiration are illustrated. The effect of coramine® on morphine-anesthetized experimental animals is depicted. Its effect on blood pressure, the heart, and the central nervous system is also shown, followed by a section showing the chemical structure of coramine and its effect on human beings. The last part of the film shows the antipellagric therapeutic value of the drug in both dogs and man. Although excellently photographed and well prepared, portions will seem a little drawn out and technical for most veterinarians. In general, it is both interesting and educational.

The film is recommended for viewing by practitioners and veterinary students.

Rabies Can Be Controlled

16 mm. Sound	Color; Running time 14 min.	Produced by Fordel Films Inc., New York 52, N.Y.	Available from Lederle Laboratories, Pearl River, N.Y.

This film brings out the need for dog owners to actively support rabies control programs. It emphasizes the use of avianized rabies vaccine in preventing this disease. Canine and human cases of rabies are shown only briefly. The vaccination of pets both at clinics and veterinary hospitals is demonstrated.

It is a well-directed film that should appeal to any audience.

Respiratory Diseases in Poultry

16 mm. Sound	Color; Running time 14 min.	Produced by Fordel Films, Inc., New York 52, N.Y.	Available from Lederle Laboratories, Pearl River, N. Y.

This film depicts the importance of respiratory diseases as they affect poultry. Techniques of vaccination for fowlpox, laryngotracheitis, and Newcastle disease are demonstrated.

Aureomycin® (soluble) is recommended for use in Newcastle disease, infectious bronchitis, and chronic respiratory disease. The use of combined Newcastle disease and infectious bronchitis dust vaccine is demonstrated.

The role of the veterinarian in controlling and preventing disease of poultry is completely ignored.

While the difficulties of differential diagnosis is mentioned several times, the proper approach to diagnosis appears to have been deliberately omitted.

Because of the shortcomings listed above, the film can not be recommended for showing to professional or lay audiences.

Second Sight

16 mm. Sound	Black and white; Running time 13 min.	Produced by RKO Pathe, Inc.	Available from Gaines Dog Research Center, 250 Park Ave., New York 17, N.Y.

This is a documentary film dealing with the training of dogs that lead the blind.

Blind persons shown in the film are actually blind and the story portrays how such training transforms the entire life of the blind person.

The film is recommended for lay audiences and groups interested in the training of dogs.

Sentinels of Milk

	Color;	Produced by, and available from,	
16 mm.	Running time	Capitol Film Service, 224 Abbott	Rental
Sound	20 min.	Rd., East Lansing, Mich.	$5.00 per day

The purpose of this film is to outline the fundamentals necessary for the production of good, clean, wholesome milk. The four sentinels of quality milk production shown are: (1) cleanliness, (2) health, (3) quality, and (4) safety. These sentinels are depicted by showing the various steps essential for the production of high quality milk. The use of the strip cup, collecting milk samples in the barn, a good milk house, thorough cleansing and sanitizing of utensils, and having clean, healthy cows are some of the factors pointed out as being absolutely essential. There are also illustrations and depictions of the effect of temperature on bacteria, the effect of sanitizing and cleaning milking equipment, and milk being sampled and tested for quality before and after bottling. The section illustrating how milk is tested for quality in the modern milk-testing laboratory is thorough.

An excellently photographed and well-prepared picture, it is primarily intended for laymen and most suitable for showing to lay groups. It will be of interest to veterinarians and to students of veterinary medicine, but there is not much scientific or technical information included. Veterinarians will use this film primarily to show the essentials of quality milk production to civic clubs and similar organizations.

Sulmet Sulfamethazine in the Treatment of Livestock Disease

	Color;	Produced by Princeton	Available from Lederle
16 mm.	Running time	Film Center, Princeton,	Laboratories, Pearl
Sound	25 min.	N. J.	River, N. Y.

This film is intended to show the major infectious diseases of horses, swine, sheep, beef cattle, and dairy cattle and how they may be treated with sulmet sulfamethazine.

As a film for a specific product, it is factual, practical, and well presented. It is dated (1949) by the time devoted to illness in draft horses and reference to 10 million of that species. Otherwise the animal features are very realistic. Technically, it may be only on thin ice when it refers to "necro" in pigs as "bacterial dysentery" and in stating that, in pneumonia, fever may be present for several days before other signs are noticeable.

In view of the disregard for the need for adequate veterinary diagnosis before attempting to treat economically significant diseases of livestock, this film can not be recommended for professional or lay audiences.

The Smallest Foe

	Color;		Available from Lederle
16 mm.	Running time	Produced by Willard	Laboratories, Pearl
Sound	20 min.	Pictures, Inc.	River, N. Y.

This film depicts a trip through the laboratories of Lederle Laboratory Division, American Cyanamid Company, Pearl River, N. Y., showing equipment and facilities available to conduct research by this company. Requirements peculiar to virus and rickettsial research are shown.

Approximately half of the film deals with the development of products used to treat or prevent livestock diseases. The technique employed for the administration of hog cholera vaccine is poorly done, with a complete lack of asepsis.

Great care in developing products is emphasized and the inconsistency of disregarding the importance of careful and professional administration of the product is apparent, at least to veterinary viewers.

Despite the emphasis on advertising and other shortcomings, the film has value in showing the complexities of research and production, but it can not be recommended for professional or lay audiences.

Tom Turkey—All American

	Color;	Produced by Fordel	Available from Lederle
16 mm.	Running time	Film, Inc., New York	Laboratories, Pearl
Sound	12 min.	52, N. Y.	River, N.Y.

This film contains some excellent sequences on symptoms and lesions seen in blackhead and infectious sinusitis of turkeys.

The recommendations made regarding the prevention and control of diseases of turkeys are fundamentally sound.

Most viewers will find much of value in this film in spite of its emphasis on advertising the company's products.

Training You to Train Your Dog

16 mm. Sound	Color; Running time 32 min.	Produced by United Specialists	Available from Gaines Dog Research Center, 250 Park Ave., New York 17, N. Y.

The basic principles of obedience training for dogs individually and in group classes are described in this film. The use of the chain collar, properly applied, and the manner in which a dog should be trained to perform such obedience commands as "heel," "come," "sit," "stand," and "stay" are pictured. Nationally known obedience experts demonstrate this training before classes of children and adults, working with several breeds of dogs. The photography and the training techniques are excellent; the narration by Lowell Thomas is good. Also, scenes showing some of the slightly more advanced stages of training, such as jumping over a stick and training a dog to stay down at command, are depicted.

This film will be interesting and educational to all dog owners who want to learn how to train their pets. Veterinarians will find it interesting and informative. The excellent photography and presentation make it a film that will be well received before any group.

Training You to Train Your Dog (Advanced)

16 mm. Sound	Color; Running time 27 min.	Produced by United Specialists	Available from Gaines Dog Research Center, 250 Park Ave., New York 17, N.Y.

This film shows how a dog is trained to jump over a solid hurdle, a bar hurdle, and finally over the long jump. Each type of hurdle requires a different technique and in each instance the physical stature of the dog must be considered in providing hurdles of appropriate height. In addition to jumping, the picture shows how the dog is trained to retrieve a dumbbell over the hurdle and to return it to the owner. Steps in teaching the dog to "speak" and to stop barking are also shown.

The final and most difficult portion of the training program shown consists of teaching the dog to trail a scent from a starting point. This consists of several stages, shown carefully so that anyone wishing to train his dog can follow the steps outlined and achieve the same results. This training is also useful in teaching dogs to find items lost by the owner, whether or not the dog knows when or where they were dropped.

This film can be utilized to acquaint veterinarians and dog owners with the procedure involved in the training of a dog.

True Story of Hog Cholera

16 mm. Sound	Color; Running time 23 min.	Produced by Staepelworth Productions, Indianapolis, Ind.	Available from Anchor Serum Company, South St. Joseph, Mo.

This film, advertising the company's products, is beamed at farmer users of veterinary products. It states that no special skill is necessary for the successful vaccination of swine against hog cholera. It even shows two girls, each with a syringe, doing the simultaneous vaccinating. It also states that no preinjection swabbing is necessary if the pigs are clean. Sanitation is most flouted, however, when a man is shown doing a necropsy on a pig dead of cholera, which is lying on the ground; the man is wearing rubber gloves and a white coat but *no* rubber protection for his dressy shoes.

Otherwise, the film is realistic and well done and provides an interesting demonstration of the production of the hog cholera vaccine, including the passage of the virus in rabbit embryos *in utero*.

Statements appearing in the commentary of the film such as "skilled hands and training are not required to do a good vaccinating job" make the film unacceptable to both professional and lay audiences familiar with basic concepts of disease prevention.

Way of a Field Champion

16 mm. Sound	Color; Running time 25 min.	Produced by Norman Wright	Available from Gaines Dog Research Center, 250 Park Ave., New York 17, N. Y.

The system of training the various breeds of field dogs is shown in this film. The opening scenes are action shots of Beagles, English and Irish Setters, Springer and Cocker Spaniels, and retrievers. Some of the scenes are from actual field trials.

The main portion of this picture depicts the training of a champion retriever, Freehaven J., beginning with puppyhood. The system for training of the elementary commands, as well as the more advanced training of retrieving in water, "doubles," and hand signaling is all clearly shown.

The entire film is interesting, well photographed, and well documented. It is, of course, primarily for showing before sportsmen, but veterinarians will enjoy it and benefit from the knowledge of how a field champion is trained.

With Dog and Gun

16 mm. Sound	Color; Running time 30 min.	Produced by David M. Newell	Available from Gaines Dog Research Center, 250 Park Ave., New York 17, N. Y.

This film depicts the use of field breeds of dogs in hunting. The work of well-schooled dogs is featured and the finer points of bird work explained.

The photography is excellent and most viewers will thoroughly enjoy the suspense, excitement, and pleasure associated with hunting while watching this film.

This film is highly recommended for groups interested in a recreational film portraying dogs.

STUDENT CHAPTER ACTIVITIES

California Chapter.—The highlights of the fall activities of the University of California Student Chapter of the AVMA were a smoker held to introduce the incoming freshmen to the faculty and student body, a successful winter formal, and a barbeque sponsored by the freshman class.

The following speakers were featured at the scientific sessions: Dr. Larry Proctor, Concord, Calif., a recent graduate; Mr. and Mrs. Vick Gray, manager of the California Dairy Breeders Association.

The seniors were hosts to medical students from the Berkeley campus in November. The group spent the day in the veterinary department and visited various classes and activities. A dinner terminated the event.

The Chapter has attained 100 per cent membership of the veterinary students. The following officers served during the fall term: Glen Reck, president; Leroy Krum, vice-president; Horace Warner, treasurer; and Janet Copland-Wentz, Secretary. Dale Johnson will serve as president during the spring semester.

s/JANET COPLAND-WENTZ, *Secretary.*

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Illinois Chapter.—At the three fall meetings of the University of Illinois Student Chapter of the AVMA, the following speakers addressed the group: Mr. Charles Pond, gymnastic coach of the University; Dr. Fred J. Kingma of Abbott Laboratories, North Chicago; and Dr. Fuller of the botany department at the University.

The annual freshman welcome and the fall dance, in conjunction with the short course, met with the whole-hearted approval of club members and alumni. Another social function, the Christmas party, was held on December 19.

Something new in increased revenue for the Chapter, besides a raise in dues, will be the installation of a candy bar and coffee service in the new large animal clinic. A laundry service is also being considered.

s/JOAN OWENS, *Secretary.*

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Missouri Chapter.—The regular monthly meeting of the University of Missouri Student Chapter of the AVMA was held on Nov. 14, 1955.

The guest speaker was Mr. George Spencer, state senator who introduced the bill which later became the Missouri brucellosis law. He spoke on the problems involved in state legislation.

A motion was passed that the Chapter send forms to all practitioners in the state to obtain information for summer student employment.

The annual fall dance was held December 17.

s/GARLAND LINDSEY, *Secretary.*

WOMEN'S AUXILIARY

Mrs. Veterinarian—One Year Old.—Down one aisle in a cap and gown—out the other in pinks and greens. That's the way we started our practice. A two-year delay in a young graduate's career seems to be the current fashion, but it needn't prove to be an impediment.

We arrived at the Medical Field Service School, Fort Sam Houston, Texas, not knowing exactly what to expect, and soon received our first of many surprises. It was fun. Being wives of veterinarians, we soon found much in common with other recent graduates. While our husbands were attending military classes, we had our first opportunity to relax and enjoy swimming, window shopping, and sight seeing. Weekend excursions to points of interest in Texas and Mexico dominated our social activity, but we also managed a few get-togethers during the week.

When we reported to our new assignments, we again found other veterinary officers ready to make us feel at home. This professional relationship proved to be the center of a very pleasant circle. Through this association, we have been able to obtain many new ideas that will undoubtedly prove valuable when planning for the future.

Due to the nature of our husbands' military duties, many of us have been unable to use all of our training received as student veterinary wives. However, this training is far from lost. By taking advantage of the opportunities available to us as army wives, we are preparing to establish a permanent home and practice that will be of value to all concerned.

s/(MRS. J. P.) JOYCE HICKCOX, *Women's Auxiliary to the Missouri Student Chapter of the AVMA, Class of 1954.*

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Auxiliary to Southern Association.—The Women's Auxiliary to the Southern Veterinary Medical Association held its annual business meeting in Jacksonville, Fla., Oct. 17, 1955. There were 48 present, with ten of the 15 states represented. A letter of greeting from Mrs. Richardson, past-president of the Women's Auxiliary of the AVMA, was read by the president, Mrs. H. L. Lamb of Athens, Tenn., Mrs. C. M. Rodgers, Blandinsville, Ill., membership secretary of the AVMA Auxiliary, was a welcome guest.

The Auxiliary voted to continue, for the third year, the donations of $25 to the AVMA Research fund; $25 to the Student Loan Fund; and $25 to one of the southern schools of veterinary medicine (Alabama, Georgia, Oklahoma, and Texas). This year the donation was sent to the Oklahoma school.

Mrs. M. G. Brock of Dallas, Texas, delegate to the house of representatives of the Women's Auxiliary to the AVMA, reported on the Minneapolis meeting.

The following new officers were elected: Mrs. J. E. Scatterday, Jacksonville, Fla., president; Mrs. J. L. Sledge, Greensboro, Ala., president-elect; Mrs. C. W. Young, Mocksville, N. Car., first vice-president; Mrs. W. G. Brock, Dallas, Texas, second vice-president; Mrs. Jack Ross, Jackson, Miss., secretary; and Mrs. O. M. Strock, Charleston, S. Car., treasurer. Mrs. H. L. Lamb, Athens, Tenn., was elected delegate, and Mrs. M. R. Blackstock, Spartanburg, S. Car., alternate, to the house of representatives of the AVMA Auxiliary for the San Antonio meeting, Oct. 15-18, 1956.

The group was delightfully entertained by the Florida group with tours, luncheon, hat and flower show, smorgasbord, and a dinner and dance.

s/MRS. C. W. YOUNG, *Retiring Secretary.*

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Oregon Auxiliary.—The fall meeting of the Women's Auxiliary to the Oregon State Veterinary Medical Association was held in Salem on Oct. 29, 1955. The women enjoyed an informal coffee in the morning at the Marion Hotel. A luncheon was held in Lipman's Tea Room which was beautifully decorated with fall flowers.

The business meeting was called to order by the president, Mrs. Austin Eivers. Letters were read from the Washington State and British Columbia auxiliaries expressing appreciation of the enjoyable time their members had at the Northwest Veterinary Medical Association meeting in Portland in July. Mrs. L. Derflinger, delegate to the AVMA convention in Minneapolis, gave an interesting account of this meeting.

The following nominating committee was appointed: Mrs. S. Davis, McMinville; Mrs. O. H. Muth, Corvallis; and Mrs. L. Sprinker, Woodburn. The election and installation of officers will be at the January meeting in Portland.

After the meeting was adjourned, members enjoyed touring and shopping and the evening banquet and dance at Randall's Chuck Wagon.

s/MRS. DENNIS H. DEJONG, *Secretary.*

No invitation is necessary to become a member of the Women's Auxiliary to the AVMA. We welcome all interested women. The dues are only $2.00 per year. Just write to:

Mrs. Frank R. Booth, secretary, Elkhart, Ind.

THE NEWS

Association and Auxiliary Contribute to AVMA Research Fund

The Eastern Iowa Veterinary Association, in recognition that "animal disease research is of vital importance to veterinary practitioners," adopted a resolution urging its members to make individual contributions to the AVMA Research Fund. The Association also contributed $50 from its treasury to the fund.

Wives of veterinarians have also demonstrated their belief in research. The Women's Auxiliary to the Maryland State Veterinary Medical Association established their dues as $2.00 per year with $1.00 of this earmarked for the AVMA Research Fund.

More activities of this kind could be a valuable source of income for the much needed support of AVMA research fellowships.

A copy of the booklet "Research—the Key to Veterinary Progress," which describes the AVMA research program, may be obtained by writing to the AVMA office in Chicago.

Medical Men Discuss Civil Defense

In a symposium believed to be the first of its kind in this country, dentists, veterinarians, and physicians met in Detroit, Mich., on Nov. 16, 1955, to discuss areas in which they could aid in the event of atomic disaster. There were 34 veterinarians, 49 dentists, 191 physicians, 51 civil defense and other officials, and many observers in attendance.

A highlight of the meeting was a panel discussion by representatives of the three professions—Dr. Max L. Lichter, co-director of the Detroit Office of Civil Defense, and chairman, Wayne County Medical Society Committee on Civil Defense in Detroit; Dr. Russell W. Bunting, dental consultant to the Federal Civil Defense Administration; and Dr. C. F. Clark, dean of the College of Veterinary Medicine at Michigan State University, East Lansing.

Dr. Lichter outlined plans for handling casualties in disaster and referred to the need for assistance from dentists and veterinarians. Dr. Bunting believes that dentists should be included in civil defense planning and that they need the help of medical men to help to train them for this. Dr. Clark stated that, with some training and a chance to show what they could do, veterinarians could act as assistants to the medical men. He asked that veterinarians be given an opportunity to suggest areas in which they can serve, such as inspection of food supplies and sanitation, aid in treatment of injuries, and minimizing the threat of animal diseases.

Other talks dealt with the threat of chemical and biological warfare, nuclear weapons and radioactive fallout, psychological and sociological consequences of disaster, medical planning to meet a disaster situation, responsibilities of the U. S. Public Health Service in civil defense, and evacuation policy.

On November 16, veterinarians, physicians, and dentists met with civil defense officials at the Sheraton-Cadillac Hotel in Detroit for a symposium on the medical aspects of civil defense.

Dr. Bailey, Former Research Fellow, A Leading Contributor to Veterinary Parasitology

Dr. W. S. Bailey (API '42), recipient of an AVMA research fellowship in 1948-1950, completed his graduate study at the Johns Hopkins University in 1950, from which he received the doctor of science degree. Since then, Dr. Bailey has been professor and head of the Department of Pathology and Parasitology at the School of Veterinary Medicine, Alabama Polytechnic Institute. In addition to his teaching and research activities, Dr. Bailey is serving his fifth year on the AVMA Committee on Parasitology, of which he was chairman for four years, and is also serving a second term on the A.P.I. Graduate Council, is chairman of the Admissions and Awards Committee of the School of Veterinary Medicine, is custodian and a member of the Council of the American Society of Parasitologists, and is secretary of the Research Advisory Committee of the Animal Disease Research Workers of the Southern States.

He has been a frequent contributor to the programs of state, regional, and national professional associations during the past few years. Among his more recent contributions was a paper on "Veterinary Parasite Problems" which was part of a symposium on parasite problems of the southeastern United States sponsored by the Association of Southeastern Biologists. Since climatic conditions in our southern states are favorable to the activities and reproduction of animal parasites, parasitology is of particular importance there. Dr. Bailey is recognized as a leader in that field.

Dr. Bailey has published, either as sole author or jointly with his colleagues, over 20 articles including: "An Epizootic of Hepatitis in the Dog" (*J.A.V.M.A., 121,* (Sept., 1952); "Observations

National 4-H Livestock Conservation Demonstration

Fourteen state 4-H teams competed in the National 4-H Livestock Conservation demonstrations held in Chicago on Nov. 29, 1955.

Teams, team members, and the titles of demonstrations given are as follows:

Colorado	Jane Johnson and Jane Jankovsky, Ovid	"Market to Market"
Illinois	Roland Prasse, R.R. 4, Freeport	"When Handling Livestock Easy Does It"
Indiana	J. Mark Summers, R.R. 1, Middletown; W. Caldwell, R.R. 1, Newcastle	"When Handling Livestock Easy Does It"
Massachusetts	Fred M. Boyd, R.R. 1, Box 60, North Brookfield	"Powder Your Cows"
Michigan	Frances McCalla, Whitmore; David Baldus, R.R. 2, Dexter	"Loss Prevention in the Handling of Swine"
Minnesota	Gail Sutter, R.R. 1, Guckeen; Delbert Stoner, R.R. 1, Dolliver, Iowa	"Winning the Warble War"
Missouri	Bob Jackson, R.R. 4, Independence	"A Million Dollar Grub Stake"
Nebraska	Frank Margritz, R.R. 1, Lexington; Larry Biehl, Overton	"Handling Cattle with Ease"
New York	Ronald Smith, R.R. 2, Waterloo	"Horns Gore the Pocketbook"
N. Carolina	Allan Overman, R.R. 2, Pikeville	"Wean More Pigs per Litter"
Ohio	Wilbur White and Jack White, R.R. 1, Shelby	"How Swine Sanitation Pays"
Oklahoma	Philip Young and Donald Renbarger, R.R. 5, Oklahoma City	"Eliminate Horn Damage"
W. Virginia	Anita June Given and Robert W. Given, Box 93, Cowen	"Raising Hogs Without Loss"
Wisconsin	David Grunow and John E. McFall, Rewey	"Worm Parasite Control in Beef Production"

The demonstrations are sponsored by Livestock Conservation, Inc., a nonprofit educational and research organization maintained by the livestock and meat industry.

Dr. W. S. Bailey

on the Possible Relation of Malignant Esophageal Tumors and *Spirocerca Lupi* Lesions in the Dog," *Am. J. Vet. Res., 16,* (Jan., 1955); "Notes on a Recent Outbreak and Experimental Reproduction of Hepatitis X in Dogs" (*J.A.V.M.A., 127,* (July, 1955); and "Experimental Infection of the Chinchilla with *Hymenolepis Nana* var. *Fraterna* (*J. Parasitol., 39,* (1953). The latter parasite was the subject of his thesis when he received his D.Sc. degree at John Hopkins University in 1950.

A New School of Veterinary Medicine at the University of Cambridge, England

The opening of the School of Veterinary Medicine, University of Cambridge, was solemnized on October 20, 1955. The Queen and the Duke of Edinburgh attended. The Chancellor made an address of welcome to which Her Majesty graciously replied.

This school has been in the process of development since 1909 when the first buildings were established for observation of certain animal diseases. In 1927, the Institute of Animal Pathology was fully established. In 1947, planning for a veterinary school began and the first students entered in 1949. The first graduates received their degrees in June, 1955.

Aerial View of the Site of the School of Veterinary Medicine, Cambridge, England

1—Department of Geodesy and Geophysics; 2—Observatory; 3—Madingley Road; 4—Animal Health Unit (Merton Hall Farm); 5—Cavendish Laboratory Unit.

New Building of the School of Veterinary Medicine

6—Laboratories; 7—Teaching and Research Block; 8—Library; 9—Hospital; 10—Animal Houses for Hospital.

Intermountain Association—January 16-18

The twenty-eighth annual meeting of the Intermountain Veterinary Medical Association will be held Jan. 16-18, 1956, at the Hotel Utah in Salt Lake City.

At the scientific session, Brig. Gen. Wayne O. Kester, V.C., U. S. Air Force, president-elect of the AVMA, will read a paper on veterinary medicine and the Air Force. Other outstanding speakers and their subjects are Frank K. Bracken (bovine leptospirosis) and Louis Madsen (ruminant bloat and nutrition in beef cattle), State College of Washington, Pullman; F. K. Ramsey, Iowa State College (mucosal disease complex); A. K. Kuttler, ARS. U.S.D.A. (brucellosis program of the Intermountain states); Chester Kennedy, Elko, Nev. (range practice); W. G. Magrane, Mishawaka, Ind. (diseases of the eye); R. D. Radeleff, Kerrville, Texas (toxicology of insecticides); Virgil B. Robinson, Pitman-Moore Co. (mycotic diseases of domestic animals); and Myron Thom, Pasadena, Calif. (x-ray diagnosis and therapy).

s/EDWARD A. TUGAW, *Secretary.*

Ralston Purina Fellowship Awards Program for 1956-1957

The Ralston Purina Company has announced that ten fellowships will be granted for graduate study in agricultural research during 1956-1957. The awards will be made in the fields of nutrition and physiology research as applied to dairy, poultry, and animal husbandry; and in research of transmissible diseases of livestock and poultry. Not more than three fellowships shall be granted in dairy husbandry, animal husbandry, and poultry husbandry; and not more than one in the field of veterinary science.

Selection of the recipients will be made by the following committee chosen as representatives by the associations indicated: Dr. James McGinnis, Poultry Science Association; Dr. Rufus Cox, American Society of Animal Production; Dr. L. C. Ferguson, American Veterinary Medical Association; Dean C. A. Elvehjem, Land-Grant College Association; and Dr. J. W. Pou, Dairy Science Association.

Persons who are interested in applying should write to the Ralston Purina Research Awards Committee, c/o Mr. J. D. Sykes, Ralston Purina Co., St. Louis 2, Mo.

AMONG THE STATES AND PROVINCES

California

State Association.—The midwinter conference of the California State Veterinary Medical Association will be held at the School of Veterinary Medicine, University of California, Davis, on Jan. 23-25, 1956.

In addition to members of the staff, the following outstanding speakers will present papers at the scientific session: R. J. Beamer, School of Veterinary Medicine, A. & M. College of Texas, College Station; Charles J. York, Pitman-Moore Co., Indianapolis; Morris Erdheim, Dawes Laboratories, Chicago; C. P. Schmidt, Worthington, Minn.; E. A. Woelffer, Oconomowoc, Wis.; and R. D. Radeleff, veterinarian in charge, Animal Disease and Parasite Research Branch, U.S.D.A., Kerrville, Texas.

s/HERB WARREN, *Assistant Executive Secretary.*

Indiana

Cooperative Serum Plant Sold.—The serum plant at Thorntown which was launched in 1915 by an organization of swine breeders, and sold in 1947 to the Farm Bureau, has recently been purchased by a corporation formed by 50 veterinarians. It will be known as the Hoosier Veterinary Laboratories, Inc., with Dr. Henry Lidikay, of Darlington, as president. The firm will also carry a full line of veterinary biological products and supplies.

Iowa

State Association.—The seventy-third annual meeting of the Iowa Veterinary Medical Association will be held Jan. 17-18, 1956, at the Fort Des Moines Hotel in Des Moines.

The following out-of-state speakers will address the group: Drs. S. H. McNutt, Madison, Wis. (bovine leptospirosis); H. L. Marsh, Princeton, Ill. (cattle practice); W. F. Guard, Columbus, Ohio (general surgical procedures); Floyd Cross, Fort Collins, Colo., president of the AVMA (rhinotracheitis of feedlot cattle); R. D. Turk, College Station, Texas (parasite problems in cattle); and P. E. Madsen, Sheridan, Wyo. (beef cattle practice).

Two of the outstanding features of the program will be a swine disease forum by Iowa veterinarians, with F. H. Kelly, of Goldfield as leader; and a small animal section program with Dr. R. J. Beamer of College Station, Texas, and Dr. George R. Burch of New Augusta, Ind., participating.

A registration of 600 veterinarians and 250 auxiliary members is expected.

s/F. B. YOUNG, *Secretary.*

Kansas

Borden Award Presented to Joseph E. Landholm.—In November, the Borden Award, $300 presented annually to the veterinary student attaining the highest grade average during his first six semesters of professional course work, was presented to Joseph E. Landholm, senior in the School of Veterinary Medicine at Kansas

State College, for his outstanding scholastic work. His award-winning average was 2.71559 (2.0 equals B, 3.0 equals A). He was followed closely by Thomas B. Hanshew of Larned (2.71028 ave.); and Richard Kirkeminde of Alta Vista (2.7 ave.).

Mr. Landholm is a member of Alpha Zeta, honorary agricultural fraternity, and of the student chapter of the AVMA.

Kentucky

Kentucky Veterinarians Purchase Laboratory.—A group of 21 Kentucky veterinarians, 15 of them in Lexington, together with Mereworth Farms of Lexington, have purchased the entire equipment and records of the modern laboratory established by Crown Crest Farms in 1953. The new company will be known as "Kentucky Veterinary Laboratories Co-operative, Inc." and will continue to do urine, blood, and bacteriological examination for any stable or farm in the state when presented through a veterinarian. Samples are invited from the horse and cattle industries and from small animal owners.

Louisiana

Conference for Veterinarians.—At the twenty-fifth annual conference for Louisiana veterinarians at the University of Louisiana in Baton Rouge on Jan. 31-Feb. 1, 1956, Dr. C. D. Van Houweling, director of Livestock Regulatory Programs, ARS, U.S.D.A., will report on the outlook for brucellosis eradication and tell of the recent progress in animal disease eradication. Dr. Rue Jensen, Colorado A. & M. College, Fort Collins, will present a paper on infectious rhinotracheitis and mucosal diseases of cattle, with illustrations.

Other outstanding speakers are: Jack Knowles, Miami (small animal subjects); L. E. Harris, Norden Laboratories, Lincoln, Neb. (practical diagnostic tests; and the veterinarian on the witness stand); Carl Fink, Groves, Texas (bovine and equine diseases common to coastal areas).

In addition to the out-of-state speakers, Dean J. G. Lee, Jr., College of Agriculture, L.S.U., who sponsored the first conference 25 years ago and has continued to support it, will talk to the group—his last time, as "Major" Lee retires at the end of June, 1956. Dr. John Fox, Tulane, will discuss the possible application of avianized rabies vaccine to man. During the afternoon of the second day, there will be a meeting of the practitioners participating in the brucellosis program.

s/W. T. OGLESBY.

Minnesota

State Association.—The fifty-ninth annual meeting of the Minnesota Veterinary Medical Association will be held at the St. Paul Hotel in St. Paul on Jan. 23-25, 1956.

Among the outstanding program speakers will be R. D. Shuman of Beltsville, Md., who will discuss Control of Swine Erysipelas, and C. J. Norden, Jr., Lincoln, Neb., Erysipelas Vaccine Avirulent; H. E. Jensen, Cleveland, and H. D. Simpson, Ames, Iowa, Diseases of the Canine Eye and Plastic Prostheses for the Canine Eye; Dr. Mark Morris, Topeka, Kan., Canine Nutrition; W. F. Guard, Columbus, Ohio, Pleasure Horse Practice; A. A. Case, Columbia, Mo., Poisonous Plants; John W. Carey, West Liberty, Iowa, Beef Cattle Practice; Margaret Sloss, Ames, Iowa, Laboratory Procedures and Diagnostic Aids; and A. C. Todd, Madison, Wis., Applied Parasitology in Cattle, Sheep, and Swine Practice.

The president and secretary of the state agricultural organizations will be special guests of the Association and will be honored at the banquet. Governor Orville Freeman will be the banquet speaker.

s/B. S. POMEROY, *Secretary*.

Missouri

Greater St. Louis Association.—On Dec. 2, 1955, the Greater St. Louis Veterinary Medical Association and its Women's Auxiliary met at the Sheraton Hotel. After separate business sessions, the two groups met for the scientific session, a panel discussion on the educational aspects of fluoridation of water, and poliomyelitis and rabies control programs. The panel consisted of W. Kenneth Grubb, director of health education in the St. Louis County Health Department, as moderator; Ralph Rosen, D.D.S., chairman, Council on Dental Health, Missouri Dental Society, who discussed fluoridation; John Weaver, executive director, St. Louis and St. Louis County chapter, National Foundation for Infantile Paralysis, discussed poliomyelitis; and Clarence E. Pearson, public health educator, St. Louis Health Division, rabies.

After the meeting, members enjoyed the annual Christmas party.

s/ALLEN B. SHOPMAKER, *Secretary*.

Nebraska

State Association.—The fifty-ninth annual meeting of the Nebraska State Veterinary Medical Association was held Dec. 6-8, 1955, at the Hotel Lincoln in Lincoln.

The first day was a business session and the reports of the various committees were heard. During the next two days, the following program was presented: Drs. E. Von Tour, Alliance (a motion picture on tibial fractures in the cow); D. F. Walker, Broken Bow (surgical procedure in the cow); Dorr Scott, Knoxville, Iowa (swine problems); H. J. Hill, School of Veterinary Medicine, Colorado A. & M. Col-

lege, Fort Collins (bovine infertility and sterility); Lee Phillips, Denver, Colo. (canine practice); and Rue Jensen, School of Veterinary Medicine, Colorado A. & M. College, Fort Collins (rhinotracheitis and its differentiation from mucosal disease).

The new officers of the Association are: W. J. Simic, Beatrice, president; E. H. Von Tour, Alliance, president-elect; and W. T. Spencer, Lincoln, secretary-treasurer. The board members are: N. W. Kruse, Genoa; J. H. Magilton, David City; D. L. Karre, Ord; H. E. Hedlund, Wahoo; and Carl Majerus, Falls City.

s/W. T. SPENCER, *Secretary.*
PAUL L. MATTHEWS, *Resident Secretary.*

New York

New York City Association.—The regular meeting of the Veterinary Medical Association of New York City, Inc., was held Dec. 7, 1955, at the New York Academy of Sciences. The guest speaker was Dr. Hans Meier, resident, Department of Pathology, Angell Memorial Animal Hospital, Boston. He discussed the clinical and pathological aspect of vegetative valvular endocarditis in small animals.

s/C. E. DECAMP, *Secretary.*

Ohio

State Association Memorial Library.—The Ohio State Veterinary Medical Association has established a section in the library of the College of Veterinary Medicine at the State University which will comprise books donated by the Association in memory of deceased members. A book will be given instead of sending flowers at the time of a deceased member's funeral.

The college library has arranged a special section where the "living memorial" books will be shelved and each book will contain a bookplate, "Memorial Library—Ohio State Veterinary Medical Association—The Ohio State University—This book in memory of ....."

Tennessee

State Association.—The forty-eighth annual meeting of the Tennessee Veterinary Medical Association will be held Jan. 15-17, 1956, at the Andrew Jackson Hotel in Nashville.

The following out-of-state speakers will address the scientific session: Drs. John R. Dick, Fort Dodge Laboratories, Fort Dodge, Iowa; W. S. Bailey, Auburn, Ala.; W. O. Slappey, Fayetteville, N. Car.; and A. H. Craige, Jr., Pitman-Moore Co., Indianapolis, Ind.

s/H. W. HAYES, *Secretary.*

Utah

Dr. Bay Awarded Schweitzer Medal.—Dr. Robert C. Bay (COL '50) of Salt Lake City was the recipient of the first Schweitzer medal, an award which is to be presented each year by the Animal Welfare Institute to a scientist who makes an outstanding contribution to animal welfare. Dr. Ray is in charge of the 450 Beagles at the Radiobiology laboratory, College of Medicine, University of Utah. The award was made at Michigan State University, Sept. 8, 1955.

Virginia

State Association.—On Jan. 22-24, 1956, the Virginia Veterinary Medical Association will hold its fifty-ninth annual meeting at the John Marshall Hotel in Richmond.

Presentations by out-of-state speakers will include an address on legislation of interest to the profession by Brig. Gen. J. A. MacCallam of the AVMA Washington office; Bovine Sterility by K. McEntee of Cornell University; Nervous Disorders of Large Animals and Intracranial Pathology of the Dog, J. T. McGrath, University of Pennsylvania; Monkeys as Potential Patients and Advances in Orthopedic Surgery in Small Animals, W. I. Gay, N.I.H., Bethesda, Md.; and Mastitis Control, A. R. Drury, Michigan State University. Dr. W. L. Threlkeld will discuss parasite control and J. R. Rooney, clinical pathology for the practitioner. Both men are staff members at V.P.I.

The program will feature a report from the state veterinarian, a business meeting, banquet and dance, and a round-table discussion with the speakers at a luncheon.

s/WILSON B. BELL, *Secretary.*

FOREIGN NEWS

Chile

Chilean Society Holds Veterinary Convention.—The Chilean Society for Veterinary Medicine held its first national veterinary convention in Santiago in October, with 150 veterinarians in attendance. The society proudly announces the reports of their committees for zootechnics, including reports on livestock production, animal nutrition, aviculture and cuniculture, pisciculture, animal health, and public health.

s/ARTURO HERNANDEZ, *AVMA Correspondent.*

DEATHS

★**Clifton D. Lowe** (OSU '10), 72, Washington, D.C., died Dec. 23, 1955. Nationally known as a livestock authority, Dr. Lowe had served as a judge in many purebred and market livestock events throughout the country. For many years he was a contributor to the leading agricultural and livestock publications.

After receiving his D.V.M. degree, Dr. Lowe served as instructor in animal husbandry at the Pennsylvania State College. He then was appointed veterinary inspector for the Bureau of

Animal Industry, U. S. Department of Agriculture. Some of his activities included eradication of the cattle tick, foot-and-mouth disease, and the sheep scab in the West. He was for 28 years the joint representative of the Bureau of

Dr. Clifton D. Lowe

Animal Industry and Extension Service in coordinating and fostering educational programs and activities in livestock production for the Agriculture Department in cooperation with land-grant colleges. A month before he retired, in 1951, Dr. Lowe was awarded the Superior Service Award of the U.S.D.A. for his work with the Department.

Dr. Lowe served for many years as a member of the National Livestock Loss Prevention Board, as a member and former chairman of the Public Relations Committee of the AVMA, and was also a member of the American Association for the Advancement of Science, the American Society of Animal Production, the U. S. Livestock Sanitary Association, and the National Association of Federal Veterinarians. He was made a life member of the AVMA in 1953.

He is survived by his widow, nee Nora Mae Anderson; a son, a daughter, and five grandchildren.

L. E. Ault (KCV '16), Esbon, Kan., died Sept. 22, 1955. Dr. Ault was a general practitioner.

John P. Beck (ONT '06), 76, Dual Park, Md., died Sept. 26, 1955. Dr. Beck had worked as a meat inspector for the U.S.D.A. for forty years prior to his retirement in 1951.

Harry L. Bennett (STJ '23), O'Neill, Neb., died Aug. 7, 1955. Dr. Bennett was a general practitioner.

James T. Black (KSC '22), 62, Vineland, N. J., died during the summer of 1955. Dr. Black was founder and director of the New Jersey Poultry Laboratory in Vineland.

Frederick C. Dettner (NYA '04), 72, Riverhead, N. Y., died Sept. 13, 1955. Dr. Dettner had practiced in the Riverhead area for 51 years. He is survived by his widow and two sons.

Everett I. Holman (IND '18), 64, Decatur, Neb., died Aug. 1, 1955. Dr. Holman was a general practitioner.

Foster H. Hume (KCV '11), Butler, Mo., died Aug. 15, 1955. Dr. Hume was a general practitioner.

Frank W. Major (STJ '18), 65, Fort Scott, Kan., died Oct. 5, 1955. Dr. Major had been in poor health for some time. He had practiced for many years in Arcadia, Kan.

★**Clifford H. Milks** (COR '30), 48, Owego, N. Y., died Aug. 14, 1955. Dr. Milks was a veteran of World War II, and was a member of the New York State and Southern Tier Veterinary Medical Associations and of the AVMA. He is survived by his widow, one daughter, and three sons.

★**Walter S. Packer** (UP '49), 34, Oneonta, N. Y., died Nov. 7, 1955, of asphyxiation from coal gas. His wife also died in the tragedy. Dr. Packer was employed by the U.S.D.A. after his graduation and was later on the staff of the College of Agriculture at Rutgers University as a poultry pathologist before going to Oneonta where he was director of the Otsego County Poultry Disease Laboratory, a branch of New York State Veterinary College. He had joined the AVMA in 1949. The couple is survived by a 2-year-old daughter.

Archa L. Peterson (MCK '16), 62, Clarks Hill, Ind., died July 6, 1955. Dr. Peterson had served in the Veterinary Corps, U. S. Army, during World War I, and had practiced in Clarks Hill for more than 20 years.

Roland D. Shireman (KCV '03), 75, Richland Center, Wis., died July 30, 1955. Dr. Shireman had practiced for more than 50 years.

David F. Stouffer (KCV '06), 75, Bellevue, Neb., died Oct. 3, 1955. Dr. Stouffer was with the Meat Inspection Department of the U.S.D.A. until his retirement in 1947. He is survived by his widow, three daughters, two sons, and thirteen grandchildren.

James T. Stuart (CHI '89), 86, Alliance, Ohio, died Oct. 15, 1955. Dr. Stuart had served as food and milk inspector for Alliance for many years. He is survived by his widow, one son, and one daughter.

Edward F. Westerheide (OSU ' 11), 67, Minster, Ohio, died Oct. 1, 1955. Dr. Westerheide retired in 1950, after practicing in Minster for forty years. He is survived by his widow and five children.

★Indicates members of the AVMA.

Chloromycetin in Treatment of Complications Due to Secondary Invaders of Canine Distemper and of Gastro-Enteritis
Fred Gasow, D.V.M., and Edwin Oja, D.V.M.
Gasow Veterinary Hospital, Birmingham, Michigan.
The Clinical Use of Chloromycetin in Canine Ocular Infections
W. G. Magrane, D.V.M.
Mishawaka, Ind.
A. S. Schlingman, D.V.M., M.Sc., and Mary C. Manning, B.S.
Research Laboratories, Parke, Davis & Co., Detroit, Mich.
Chloromycetin Therapy in Veterinary Medicine
J. W. EASTMAN, D.V.M.; A. S. SCHLINGMAN, D.V.M., M.S.; MARY C. MANNING, B.S.; F. E. EADS, D.V.M., M.S.
Rochester and Detroit, Michigan
Chloromycetin* Therapy in An Outbreak of Hard Pad
M. B. TOOSEY, M.R.C.V.S.
WIMBORNE, DORSET
Chloromycetin Palmitate in Small-Animal Medicine
Elroy C. Jensen, D.V.M.
Chloromycetin Palmitate in the Treatment of Kennel Cough
James E. Cook, D.V.M.
Holland, Mich.
The Clinical Use Of Chloromycetin In Dogs And Cats
by
R. G. SCHIRMER, D.V.M., F. E. EADS, D.V.M., M.S.
Blood Level Studies in Dogs Following the Administration of Chloromycetin
F. E. EADS, D.V.M., M.S.; A. J. GLAZKO, Ph.D.; L. M. WOLF, JOHN EHRLICH, Ph.D.; M. GALBRAITH, M.S.
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COMING MEETINGS

Pennsylvania, University of. Annual conference for veterinarians. School of Veterinary Medicine, University of Pennsylvania, Philadelphia, Pa., Jan. 3-4, 1956. M. W. Allam, dean.

Cornell University. Annual conference for veterinarians. New York State Veterinary College, Cornell University, Ithaca, N. Y., Jan. 4-6, 1956. W. A. Hagan, dean.

Ohio State Veterinary Medical Association. Annual meeting. Deshler-Hilton Hotel, Columbus, Ohio, Jan. 4-6, 1956. Mr. R. L. Henry, 50 E. Broad St., Columbus 15, Ohio, secretary.

Oklahoma Veterinary Medical Association. Annual meeting. Hotel May, Tulsa, Okla., Jan. 8-10, 1956. C. H. Fauks, 3421 N.W. 20 St., Oklahoma City, Okla., secretary.

Indiana Veterinary Medical Association. Annual meeting. Hotel Severin, Indianapolis, Ind., Jan. 11-13, 1956. L. M. Borst, 3315 Shelby Ave., Indianapolis, Ind., secretary.

Wisconsin Veterinary Medical Association. Annual meeting. Schroeder Hotel, Milwaukee, Wis., Jan. 11-13, 1956. B. A. Beach, 1215 Vilas Ave., Madison 5, Wis., secretary.

Tennessee Veterinary Medical Association. Annual meeting. Nashville, Tenn., Jan. 15-16, 1956. H. W. Hayes, 734 Broadway, Northeast, Knoxville, Tenn., secretary.

Intermountain Veterinary Medical Association. Annual meeting. Hotel Utah, Salt Lake City, Utah, Jan. 16-18, 1956. Edward A. Tugaw, 3015 S. State St., Salt Lake City, Utah, secretary.

Iowa Veterinary Medical Association. Annual meeting. Hotel Fort Des Moines, Des Moines, Iowa, Jan. 17-19, 1956. F. B. Young, Waukee, Iowa, executive secretary.

Virginia Veterinary Medical Association. Annual meeting. Hotel John Marshall, Richmond, Va., Jan. 22-24, 1956. Wilson B. Bell, 210 Clay St., Blacksburg, Va., secretary.

California State Veterinary Medical Association. Midwinter conference. School of Veterinary Medicine, University of California, Davis, Calif., Jan. 23-25, 1956. Charles S. Travers, 3004 16th St., San Francisco, Calif., executive secretary.

Minnesota State Veterinary Medical Society. Annual meeting. Hotel St. Paul, St. Paul, Minn., Jan. 23-25, 1956. B. S. Pomeroy, School of Veterinary Medicine, University of Minnesota, St. Paul, Minn., secretary.

North Carolina Veterinary Conference. North Carolina State College, Raleigh, N. Car., Jan. 24-27, 1956. C. D. Grinnells, State College Station, Raleigh, N. Car., chairman, conference committee.

Maryland State Veterinary Medical Association. Winter meeting. Lord Baltimore Hotel, Baltimore, Md., Jan. 26-27, 1956. John D. Gadd, Cockeysville, Md., secretary.

Oregon State Veterinary Medical Association. Annual meeting. Multnomah Hotel, Portland, Ore., Jan. 27-28, 1956. E. L. Holden, Oswego, Ore., secretary.

Ontario Veterinary Medical Association. Annual meeting. Royal York Hotel, Toronto, Ont., Jan. 27-28, 1956. G. A. Edge, Box 37, Postal Station "F," Toronto 5, Ont., secretary.

(Continued on p. 21)

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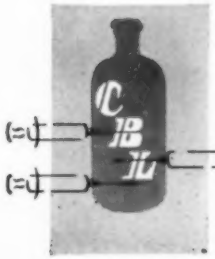

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Steclin is indicated in the treatment of these conditions when due to tetracycline-susceptible organisms: abscesses; bacterial infections associated with canine distemper; bronchitis; calf scours; diphtheria; enteritis; equine influenza; erysipelas; feline enteritis; foot rot; hemorrhagic septicemia; infectious coryza; influenza; lamb dysentery; leptospirosis in dogs; metritis; nephritis; otitis media; parotiditis; peritonitis; pharyngitis; pneumonia; pyelonephritis; septic mastitis; staphylococcal and streptococcal infections in the foal; tonsillitis; ulcerations; upper respiratory complications; urinary tract infections.

vials

Steclin Hydrochloride Veterinary for parenteral administration is supplied in vials of 100 mg., 1.0 gm. and 2.5 gm. crystalline tetracycline hydrochloride with ascorbic acid as a buffer, and procaine hydrochloride and magnesium chloride.

Solutions of Steclin Veterinary for parenteral use may be prepared with Water for Injection U.S.P., Dextrose Solution U.S.P. or Sterile Isotonic Sodium Chloride Solution U.S.P. Steclin for parenteral use should be given by deep intramuscular injection or by intraperitoneal administration.

RECOMMENDED DAILY DOSAGE: ***For small animals,*** **5 mg. per pound of body weight, administered in divided doses every 6 to 12 hours;** ***for larger animals,*** **1 to 2 mg. per pound of body weight, administered once per day.**

capsules

Capsules of Steclin Hydrochloride Veterinary for oral administration are supplied in bottles of 100, each capsule containing 250 mg. crystalline tetracycline hydrochloride.

RECOMMENDED DAILY DOSAGE: ***For small animals,*** **25 to 50 mg. per pound of body weight, administered in divided doses every 6 to 12 hours;** ***for larger animals,*** **5 to 10 mg. per pound of body weight, administered once per day.**

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Louisiana State University. Annual conference for veterinarians. Louisiana State University, Baton Rouge, Jan. 31-Feb. 1, 1956. W. T. Oglesby, head, Department of Veterinary Science, Louisiana State University, Baton Rouge, La.

Connecticut Veterinary Medical Association. Annual meeting. Hotel Bond, Hartford, Conn., Feb. 1, 1956. E. H. Patchen, 289 New Haven Ave., Milford, Conn., secretary.

Texas Veterinary Medical Association. Annual meeting. Baker Hotel, Mineral Wells, Texas, Feb. 5-7, 1956. Paul B. Blunt, 710 Maverick Bldg., San Antonio, Texas, executive secretary.

West Virginia Veterinary Medical Association. Winter meeting. Greenbrier Hotel, White Sulphur Springs, W. Va., Feb. 19-20, 1956. D. A. Munro, West Virginia University, Morgantown, W. Va., secretary.

Missouri Veterinary Medical Association. Annual meeting. Kansas City, Mo., Feb. 20-21, 1956. Paul L. Spencer, P.O. Box 283, Jefferson City, Mo., secretary.

Illinois State Veterinary Medical Association. Annual meeting. Hotel LaSalle, Chicago, Ill., Feb. 20-22, 1956. C. B. Hostetler, 1385 Whitcomb Ave., Des Plaines, Ill., secretary.

Colorado A. & M. College. Conference for veterinarians. Glover Veterinary Hospital, School of Veterinary Medicine, Colorado A. & M. College, Fort Collins, Colo., Feb. 20-22, 1956. O. R. Adams, Department of Veterinary Clinics and Surgery.

Missouri Veterinary Medical Association. Annual meeting. Hotel Continental, Kansas City, Mo., Feb. 20-21, 1956. Paul L. Spencer, P.O. Box 283, Jefferson City, Mo., secretary.

Alabama Veterinary Medical Association. Annual meeting. Whitley Hotel, Montgomery, Ala., March 18-20, 1956. M. K. Heath, School of Veterinary Medicine, Alabama Polytechnic Institute, Auburn, Ala., secretary.

Washington, State College of. Annual conference for veterinarians. College of Veterinary Medicine, State College of Washington, Pullman, Wash., April 2-4, 1956. John R. Gorham, conference chairman.

American Animal Hospital Association. Annual meeting. Hotel Fontainebleu, Miami Beach, Fla., May 23-26, 1956. W. H. Riser, 5335 Touhy Ave., Skokie, Ill., executive secretary.

Maryland State Veterinary Medical Association. Annual summer meeting. George Washington Hotel, Ocean City, Md., June 28-29, 1956. John D. Gadd, Cockeysville, Md., secretary.

Pennsylvania State Veterinary Medical Association. Annual meeting. Bedford Springs Hotel, Bedford, Pa., Sept. 12-14, 1956. Raymond C. Snyder, N.W. Corner Walnut St., and Copley Rd., Upper Darby, Pa., secretary.

American Veterinary Medical Association. Annual meeting. Municipal Auditorium, San Antonio, Texas, Oct. 15-18, 1956. J. G. Hardenbergh, 600 S. Michigan Ave., Chicago 5, Ill., executive secretary.

Foreign Meetings

World Congress on Fertility and Sterility. Naples, Italy, May 18-26, 1956. Professor T. Bonadonna, Via Monte Ortigara, 35, Milan, Italy, in charge of Veterinary Section.

Tenth International Congress of Entomology. McGill University and University of Montreal, Montreal, Canada, Aug. 17-25, 1956. J. A. Downes, Division of Entomology, Science Service Bldg., Ottawa, Ont., Canada, secretary.

International Association of Hydatidology. Sixth Congress. Athens, Greece, Sept. 14-18, 1956. Prof. B. Kourias, 1 MacKenzie King St., Athens, Greece, general secretary.

(*Continued on p. 22*)

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Regularly Scheduled Meetings

ALABAMA—Central Alabama Veterinary Association, the first Thursday of each month. G. J. Phelps, Jr., Montgomery, Ala., secretary.

Jefferson County Veterinary Medical Association, the second Thursday of each month. W. R. Laster, Jr., 213 N. 15th St., Birmingham, Ala., secretary.

ARIZONA—Central Arizona Veterinary Medical Association, the second Tuesday of each month. Keith T. Maddy, Phoenix, Ariz., secretary.

Pima County Veterinary Medical Association, the third Wednesday of each month in Tucson. E. T. Anderson, 8420 Tanque Verde Rd., Tucson, Ariz., secretary.

Southern Arizona Veterinary Medical Association, the third Wednesday of each month at 7:30 p.m. E. T. Anderson, Rt. 2, Box 697, Tucson, Ariz., secretary.

CALIFORNIA—Bay Counties Veterinary Medical Association, the second Tuesday of each month. E. Paul, Redwood City, Calif., secretary.

Central California Veterinary Medical Association, the fourth Tuesday of each month. Wilfred Pimentel, 3455 S. Elm Ave., Fresno, Calif., secretary.

East Bay Veterinary Medical Association, bimonthly, the fourth Wednesday. John T. Turver, 1201 E. 12th St., Oakland 6, Calif., secretary.

Kern County Veterinary Medical Association, the first Thursday evening of each month. B. C. Watson, 825 14th St., Bakersfield, Calif., secretary.

Mid-Coast Veterinary Medical Association, the first Thursday of every even month. W. H. Rockey, P. O. Box 121, San Luis Obispo, Calif., secretary.

Monterey Bay Area Veterinary Medical Association, the third Wednesday of each month. Lewis J. Campbell, 90 Corral de Tierra, Salinas, Calif., secretary.

Northern San Joaquin Valley Veterinary Medical Association, the fourth Wednesday of each month. Lyle A. Baker. Turlock, Calif., secretary.

Orange Belt Veterinary Medical Association, the second Monday of each month at 8:00 p.m. in Antlers Hotel, San Bernardino, Calif. Jay C. Wallis, 112 N. Girard St., Hemet, Calif., secretary.

Orange County Veterinary Medical Association, the third Thursday of each month. Donald E. Lind, 2643 N. Main St., Santa Ana, Calif., secretary.

Peninsula Veterinary Medical Association, the third Monday of each month. T. D. Harris, San Mateo, Calif., secretary.

Redwood Empire Veterinary Medical Association, the third Thursday of each month. Robert E. Clark, Napa, Calif., secretary.

Sacramento Valley Veterinary Medical Association, the second Wednesday of each month. W. E. Steinmetz, 4227 Freeport Blvd., Sacramento, Calif., secretary.

San Diego County Veterinary Medical Association, the fourth Tuesday of each month. H. R. Rossoll, 1795 Moore St., San Diego, Calif., secretary.

San Fernando Valley Veterinary Medical Association, the second Friday of each month at Eaton's Restaurant in Studio City, Calif. R. A. Button, 5954 Van Nuys Blvd., Van Nuys, Calif., secretary.

Southern California Veterinary Medical Association, the third Wednesday of each month. Howard C. Taylor, 2811 West Olive St., Burbank, Calif., secretary.

Tulare County Veterinarians, the second Thursday of each month. R. B. Barsaleau, 2333 E. Mineral King, Visalia, Calif., secretary.

COLORADO—Northern Colorado Veterinary Medical Society, the first Monday of each month. M. A. Hammarlund, School of Veterinary Medicine, Colorado A. & M. College, Fort Collins, Colo., secretary.

DELAWARE—New Castle County Veterinary Association,

(*Continued on p. 23*)

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FLORIDA—Jacksonville Veterinary Medical Association, the second Thursday of each month, time and place specified monthly. L. D. Barrett, Rt. 8, Box 572, Jacksonville, Fla., secretary.

South Florida Veterinary Society, the third Tuesday of each month, at the Seven Seas Restaurant, Miami, Fla. E. D. Stoddard, 6432 S. W. 8th St., Miami, Fla., secretary.

GEORGIA—Atlanta Veterinary Society, the second Tuesday of every month at the Elks Home on Peachtree St., Atlanta, Ga. J. L. Christopher, Smyrna, Ga., secretary.

ILLINOIS—Chicago Veterinary Medical Association, the second Tuesday of each month. Mark E. Davenport, Jr., 215 S. Edgewood Ave., LaGrange, Ill., secretary.

Eastern Illinois Veterinary Medical Association, the first Thursday of March, June, September, and December. A one-day clinic is held in May. R. P. Link, College of Veterinary Medicine, University of Illinois, Urbana, Ill., secretary.

INDIANA—Central Indiana Veterinary Medical Association, the second Wednesday of each month. Charles J. York, P. O. Box 1656, Indianapolis 6, Ind., secretary.

Michiana Veterinary Medical Association, the second Thursday of each month, at the Hotel LaSalle, South Bend, Ind. L. D. Ramsay, 719 E. Jefferson Ave., La Porte, Ind., secretary.

Tenth District Veterinary Medical Association the third Thursday of each month. W. E. Sharp, Union City, Ind., secretary.

IOWA—Cedar Valley Veterinary Association, the second Monday of each month, except January, July, August, and October, at Black's Tea Room, Waterloo, Iowa. D. A. Buchanan, Grundy Center, Iowa, secretary.

Coon Valley Veterinary Association, the second Wednesday of each month, September through May, at the Bradford Hotel, Storm Lake, Iowa. D. I. Lee, Sac City, Iowa, secretary.

Fayette County Veterinary Association, the third Tuesday of each month, except in July and August, at Pa and Ma's Restaurant, West Union, Iowa. Donald E. Moore, Box 178, Decorah, Iowa, secretary.

Northeast Iowa-Southern Minnesota Veterinary Association, the first Tuesday of February, May, August, and November at the Wisneslick Hotel, Decorah, Iowa, 6:30 p.m. Donald E. Moore, Box 178, Decorah, Iowa, secretary.

KENTUCKY—Jefferson County Veterinary Society of Kentucky, Inc., the first Wednesday evening of each month in Louisville or within a radius of 50 miles. Dr. W. E. Bewley, P. O. Box "H", Crestwood, Ky., secretary.

MARYLAND—Baltimore City Veterinary Medical Association, the second Thursday of each month, September through May (except December), at 9:00 p.m. at the Park Plaza Hotel, Charles and Madison St., Baltimore, Md. Harry L. Schultz, Jr., 9011 Harford Rd., Baltimore, Md., secretary.

MICHIGAN—Mid-State Veterinary Medical Association, the fourth Thursday of each month with the exception of November and December. Robert E. Kader, 5034 Armstrong Rd., Lansing 17, Mich., secretary.

Saginaw Valley Veterinary Medical Association, the last Wednesday of each month. S. Correll, Rt. 1, Midland, Mich., secretary.

Southeastern Veterinary Medical Association, the fourth Wednesday of every month, September through May. Gilbert Meyer, 14003 E. Seven Mile Rd., Detroit 5, Mich., secretary.

MISSOURI—Greater St. Louis Veterinary Medical Association, the first Friday of the month (except July and August) at the Sheraton Hotel, Spring Ave. and Lin-

(*Continued on p. 24*)

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dell Blvd. Allen B. Shopmaker, 136 N. Meramec, Clayton 5, Mo., secretary.

Kansas City Small Animal Hospital Association, the first Monday of each month, at alternating hospitals. W. F. Noland, 7504 Metcalf, Overland Park, Kan., secretary.

Kansas City Veterinary Medical Association, the third Tuesday of each month at Exchange Hall, ninth floor, Livestock Exchange Bldg., 1600 Genessee St., Kansas City, Mo. Busch Meredith, 800 Woodswether Rd., Kansas City 5, Mo., secretary.

NEW JERSEY—Central New Jersey Veterinary Medical Association, the second Thursday of November, January, March, and May at Old Hights Inn, Hightstown, N. J. David C. Tudor, Cranbury, N. J., secretary.

Metropolitan New Jersey Veterinary Medical Association, the third Wednesday evening of each month from October through April at the Academy of Medicine, 91 Lincoln Park South, Newark, N. J. Myron S. Arlein, 2172 Milburn Ave., Maplewood, N. J., secretary.

Northern New Jersey Veterinary Association, the fourth Tuesday of each month at the Casa Mana in Teaneck, N. J. Edward Baker, 568 Grand Ave., Englewood, N. J., secretary.

NEW YORK—New York City, Inc., Veterinary Medical Association of, the first Wednesday of each month at the New York Academy of Sciences, 2 East 63rd St., New York City. C. E. DeCamp, 43 West 61st St., New York 23, N. Y., secretary.

Monroe County Veterinary Medical Association, the first Thursday of even-numbered months except August. Irwin Bircher, 50 University Ave., Rochester, N. Y., secretary.

NORTH CAROLINA—Central Carolina Veterinary Medical Association, the second Wednesday of each month at 7:00 p.m. in the O'Henry Hotel in Greensboro, N. Car. R. T. Copeland, 1800 Walker Ave., Greensboro, N. Car., secretary.

Eastern North Carolina Veterinary Medical Association, the first Friday of each month. John D. Baker, Goldsboro, N. Car., secretary.

Piedmont Veterinary Medical Association, the last Friday of each month at 7:00 p.m. in Mull's Motel in Hickory, N. Car. W. W. Dickson, Box 1071, Gastonia, N. Car., secretary.

OHIO—Cuyahoga County Veterinary Medical Association, the first Wednesday of each month, September through May (except January), at 9:00 p.m. at the Carter Hotel, Cleveland, Ohio. Ed. R. Jacobs, 5522 Pearl Rd., Cleveland, Ohio, secretary.

OKLAHOMA—Oklahoma County Veterinary Medical Association, the second Wednesday of every month except July and August. Carl L. Clark, 127 N. W. 23rd St., Oklahoma City, Okla., secretary.

Tulsa Veterinary Medical Association, the third Thursday of each month in Directors' Parlor of the Brookside State Bank, Tulsa, Okla. Merle S. Watts, 5302 E. 11th St., Tulsa, Okla., secretary.

PENNSYLVANIA—Keystone Veterinary Medical Association, the fourth Wednesday of each month at the University of Pennsylvania School of Veterinary Medicine, 39th and Woodland Ave., Philadelphia 4, Pa. Raymond C. Snyder, 39th and Woodland Ave., Philadelphia 4, Pa., secretary.

SOUTH CAROLINA—Piedmont Veterinary Medical Association, the third Wednesday of each month at the Fairforest Hotel, Union, S. Car. Worth Lanier, York, S. Car., secretary.

TEXAS—Coastal Bend Veterinary Association, the second Wednesday of each month. J. Marvin Prewitt, 4141 Lexington Blvd., Corpus Christi, Texas, secretary.

WASHINGTON—Seattle Veterinary Medical Association, the third Tuesday of each month in the Trinity Episcopal Church, 8th and James St., Seattle, Wash. P. R. Des Rosiers, 5508 2nd Ave., N. W., Seattle 7, Wash., secretary.

(*Continued on p. 26*)

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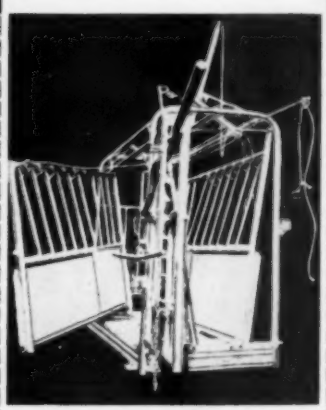

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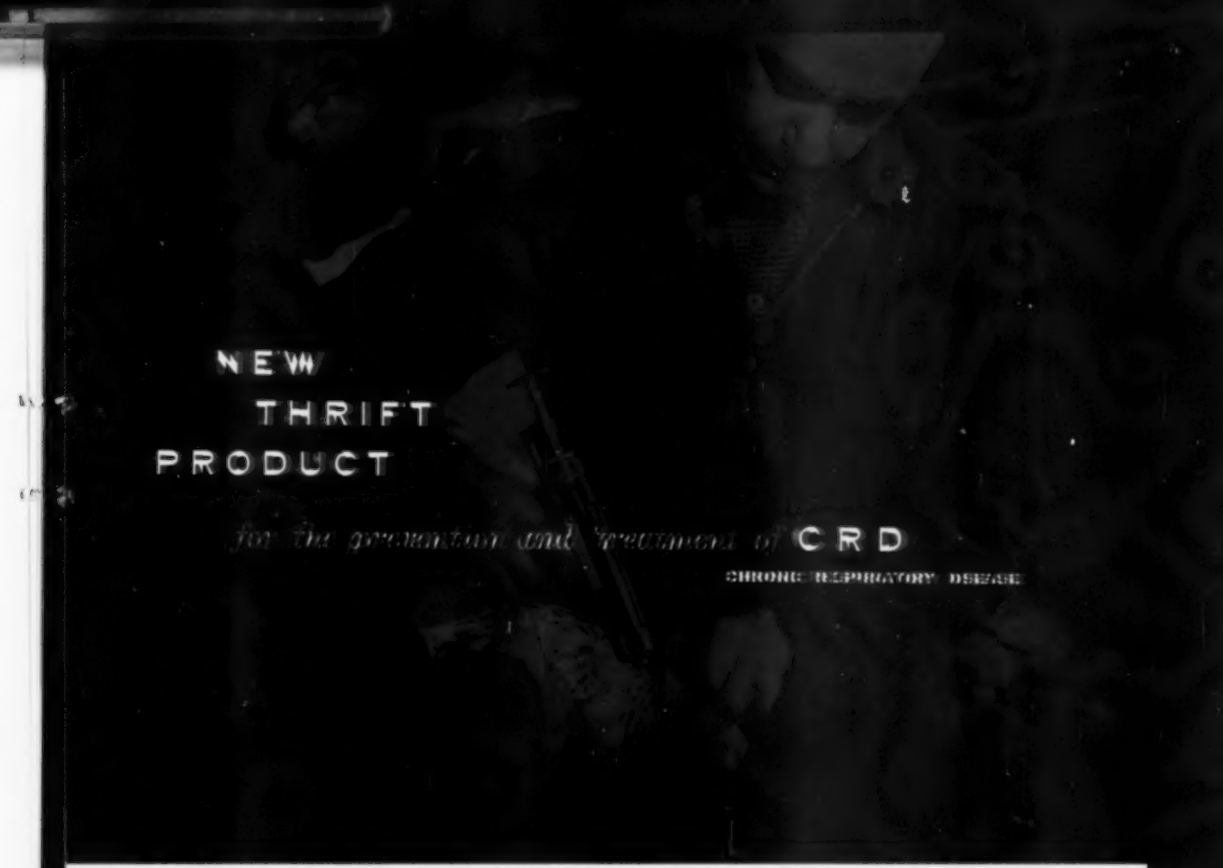

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(COMING MEETINGS—*continued from p. 24*)

South Puget Sound Veterinary Association, the second Thursday of each month except July and August. Jo Walker, Agriculture Experiment Station, Puyallup, Wash., secretary.

WEST VIRGINIA—Kyowva (Ky., Ohio, W. Va.) Veterinary Medical Association, the second Thursday of each month in the Hotel Prichard, Huntington, W. Va., at 8:30 p.m. Harry J. Fallon, 200 5th St., W., Huntington, W. Va., secretary.

WISCONSIN—Milwaukee Veterinary Medical Association, the third Tuesday of each month, at the Half-Way House, Blue Mound Rd. George F. Lynch, 201 West Devon St., Milwaukee 17, Wis., secretary.

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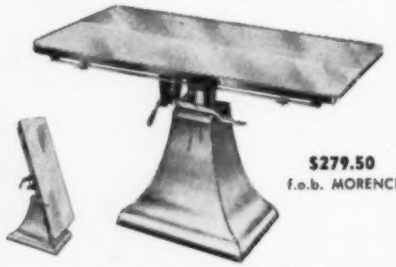


$279.50
f.o.b. MORENCI

HYDRAULIC OPERATING TABLE

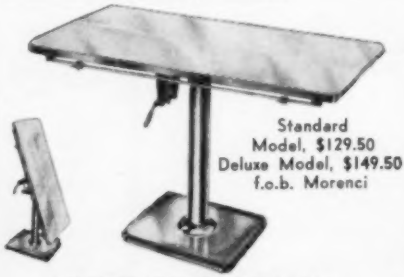
Features precision-made hydraulic unit guaranteed for life of the table. Finger-touch control raises, lowers and locks table in seconds. Large 24" x 60" top. Movable on concealed casters.

STANDARD MODEL **$99.50**

DELUXE MODEL **$129.50**

EXAMINATION TABLE

Reinforced stainless steel top in 22" x 48" size. Six tie clamps. Patented "corner compensators" automatically level table on any surface. Designed for examination and pre-surgery treatment.



Standard Model, $129.50
Deluxe Model, $149.50
f.o.b. Morenci

STAINLESS STEEL OPERATING TABLE

Chrome plated single pedestal and base combined with reinforced stainless steel top. Positive locking adjustment in twelve positions. Super size 24" x 60" top.

ALL MODELS AVAILABLE FROM LEADING SUPPLIERS

TED STOCKWELL MFG. CO.
MORENCI, MICHIGAN

CLASSIFIED ADVERTISEMENTS

Personal Want Ads—$4.00 for the first 25 words and 10 cents for each additional word; 35 cents for use of box number.

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For JOURNAL dated *1st of month* — 8th of month preceding date of issue.

For JOURNAL dated *15th of month* — 22nd of month preceding date of issue.

Names of classified advertisers using key letters can not be supplied. Address your reply to the key letters, c/o JOURNAL of the AVMA, 600 S. Michigan Ave., Chicago 5, Ill., and it will be transmitted to the advertiser.

Wanted—Veterinarians

Veterinarian wanted for Ontario County, $4,400; New York State residents. Examination Feb. 17, 1956; last date for filing applications Jan. 25, 1956. Applications and further information available at office of Civil Service Commission, Court House, Canandaigua, New York.

Experienced veterinarian wanted, capable of handling lucrative small animal hospital on Long Island. Salary plus commission first year, opportunity full partnership thereafter. New York State license required. Address "Box B 4," c/o JOURNAL of the AVMA.

Bacteriologists needed for control and research work at veterinary biological laboratory. Address "Box B 6," c/o JOURNAL of the AVMA.

Wanted—Positions

Woman veterinarian desires position; graduated 1950, Justus Liebig Veterinary College, Giessen, Germany. Five years of experience in small animal practice and some laboratory work. Address "Box B 1," c/o JOURNAL of the AVMA.

(*Continued on p. 32*)

VETERINARIANS For CALIFORNIA

Early appointments in California state government for graduate veterinarians with or without experience in practice.

Openings principally in meat inspection at this time. Opportunities for specialization and advancement.

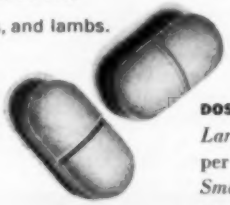
Year or longer to obtain California license. Salary range $458 to $556 for Veterinarian I.

Civil service examination in or near your city at early date. Exam also open to senior veterinary students.

Write at once for information and application blank.

CALIFORNIA STATE PERSONNEL BOARD
801 Capitol Avenue Sacramento 14

Broad-spectrum
antibiotic therapy
especially
designed for
Oral administration
in treating many
infections in
Livestock, large and
small.
Also effective
locally in
Uterine infections
and orally in enteric
infections such as
Scours in calves,
pigs, and lambs.



DOSAGE FOR SYSTEMIC THERAPY

Large animals: 5 to 10 mg. per lb. per day, preferably in divided doses.
Small animals: 25 to 50 mg. per lb. per day, in 2 to 4 divided doses.
For infectious enteritis: ½ to 2 tablets for 1 or 2 days are usually sufficient.

Pfizer TETRACYCLINE-VET

For oral administration in feed and water . . . Highly soluble, highly effective . . . **TETRACYCLINE-VET SOLUBLE POWDER** *in ½ lb. jars 25 Gm. of tetracycline hydrochloride activity per lb.*

DOSAGE FOR INTRAUTERINE THERAPY

This depends on several factors, such as the size of the animal, the severity of the infection, the response to treatment, and the convenience of re-treatment. 1 or 2 boluses placed in the vagina or in each horn of the uterus and repeated once or twice at 24- to 48-hour intervals will usually provide effective medication.

Each bolus contains 500 mg. of tetracycline hydrochloride, and is available in boxes of 5.

SOLD ONLY TO VETERINARIANS

Pfizer

Department of Veterinary Medicine
PFIZER LABORATORIES, Brooklyn 6, N. Y.
Division, Chas. Pfizer & Co., Inc.

400 Books About Pets
Listed at discounts to veterinarians.
100 Page Pet Magazine
Monthly on breeding, care, health, etc. Sample 35c. Year $3.
The best waiting room magazine published.
ALL-PETS, 22 Darling, Fond du Lac, Wis.

Correspondence

Dear Doctor:

I appreciate your letter relative to the criticism of our paper in the JOURNAL (The Pathology of a Fungus Infection Associated with a Caponizing Injury, Sept., 1955: 207-209) with reference to the term "mycelia" in captions of figures 3 and 4.

We consider Dr. Norman F. Conant's second edition of "Manual of Clinical Mycology" the best guide to fungous disease problems. On page 380 it states, "as the hyphae continue to grow and branch there soon develops a mat of growth called the mycelium." We were trying to point out that the granuloma, by special staining methods, would show a *number of hyphae* or a *mycelium.*

We were not attempting to draw attention to "a fungus hypha. . .". The photograph contains not one but several hyphae, or a mycelium.

Sincerely yours,
H. L. Chute, D.V.M., Orono, Maine.

(CLASSIFIED ADS—*continued from p. 30*)

Recent Cornell graduate licensed in New York and Connecticut desires position in small animal practice leading to percentage, partnership, or sale; married, veteran. Address "Box B 5," c/o JOURNAL of the AVMA.

Wanted—Practices

Small animal practice or partnership in Middlewest wanted by veterinarian; 10 years' experience. Substantial down payment. Replies strictly confidential. Address "Box Y 25," c/o JOURNAL of the AVMA.

For Sale or Lease—Practices

Small animal practice for sale; choice location in Virginia. No property involved, $10,000. Good lease on land, building, equipment, and apartment. Profit last year over $20,000. Address "Box A 8," c/o JOURNAL of the AVMA.

Remittance must accompany advertisement

Practice for sale, mostly large animal with small animal potential if desired. Grossing $45,000. Nearly new 5-room house and office attached, drug inventory, and 2-way radio included; $10,000 will handle. In western Iowa county seat town; good roads. Address "Box B 3," c/o JOURNAL of the AVMA.

Established small animal hospital for sale in New Orleans, La., with or without equipment; priced at

(*Continued on p. 34*)

BROAD-SPECTRUM ACTION engineered against intestinal infection

1. Start with dihydrostreptomycin for antibiotic action against enteric bacteria.
2. Add phthalylsulfacetamide for high sulfonamide concentration restricted to the intestinal tract.
3. Add a 3-sulfa combination for intestinal and systemic therapy.
4. Formulate these into a tablet of convenient size and shape, and offer it only to the graduate veterinarian, at a price which makes it economical for him to administer and profitable for him to dispense.

Direabol TRADEMARK
Supplied: bottles of 8, 25, and 100 tablets
Drugs for Veterinary Medicine, Inc. DVM P. O. Box 6676, Denver 16, Colorado

An important new idea in Distemper-Hepatitis Immunization

distemper hepatitis

sin-jex*

vaccine

Sin-jex **is the first Distemper-Hepatitis vaccine to utilize a vacuum dried** ***modified live virus*** **distemper fraction, with killed virus hepatitis fraction as diluent.** ***Sin-jex*** **gives more positive immunity against distemper: because the modified live virus distemper fraction elicits a more marked immunity response.** ***Sin-jex*** **is instantly reconstituted because of the R_L "reconsti-quick" feature.** ***Sin-jex*** **is a fine homogenous suspension which passes easily through a 22 guage needle.** ***Sin-jex*** **is easily administered with a single subcutaneous injection.** ***Sin-jex*** **may be given simultaneously with or without Anti-Canine Distemper-Infectious Hepatitis Anti-Serum.** ***Sin-jex*** **produces immunity in less than two weeks.** ***Sin-jex*** **may be used before or after weaning.**

Research Laboratories, Inc.
St. Joseph, Missouri

Available from

INDEPENDENT ETHICAL DISTRIBUTORS
selling to Licensed Veterinarians only
* TRADE MARK

Liability Insurance

for

AVMA Members

The policy, which was developed especially for Association members two decades ago, provides expert defense against claims and suits arising out of the care and treatment of animals, and will pay, to the extent of the policy limits, all expenses and damages resulting from unfavorable verdicts.

In this suit-conscious age, such protection is not only wise but, as shown by the claim files, a practical necessity.

The insurance is placed with one of the largest and most reliable underwriters in the country.

Write at once for an application and descriptive folder.

American Veterinary Medical Association

600 So. Michigan Ave., Chicago 5, Ill.

(CLASSIFIED ADS—*continued from p. 32*)

one-third the yearly gross. Good terms. Address "Box B 2," c/o JOURNAL of the AVMA.

Colorado practice for sale in town of 4,000; 80 per cent large animals. Modern 3-bedroom, ranch-style home; large and small animal facilities, 1½ acres. Terms. Address "Box B 7," c/o JOURNAL of the AVMA.

Miscellaneous

Pregnancy diagnosis in mares—45th to 150th day. Request mailing tubes; $7.00, 2 or more, $6.00 each. Pregnancy Diagnostic Laboratories, Dysart, Iowa.

Breedersleve—The disposable obstetrical sleeve. Package of 20 with detachable chest band, $5.00; lower wholesale prices. Free sample upon request. Breeders Equipment Co., Flourtown, Pa.

Remittance must accompany advertisement

For Sale—Aloe x-ray machine, radiographic and fluoroscopic unit, 50 ma., 85 kv.p.; movable automatic bucky in table and a type-B fluoroscopic screen; in excellent condition. Price $950. Address W. J. Rongaus, M.D., 601 Thompson Ave., Donora, Pa., telephone 66.

For Sale—Small animal mouth speculums. Used primarily to pass the stomach tube in dogs and cats; self-retaining, made of life-lasting plastic. Instructions included. Set of 2, $6.00. J. & G. Mfg. Co., 1585 Moore St., Akron 1, Ohio.

Bovine and Equine *Safety*

MOUTH SPECULUM

- **Safety locking feature withstands 800 lbs pressure.**
- **Allows adequate room for inserting arm from either side.**
- **Attachment available for passing stomach tube through mouth makes this operation simpler and more humane.**

Price $57.50 **POST PAID** **For stomach tube attachment add $15**

Sold to veterinarians only by makers of famous MacAllan Ear-Cropping Forms. Send check or money order, or phone Lansing 2-3797.

MacALLAN LABORATORIES

Route No. 2, Box 420 Lansing, Michigan

Death of Mr. Cohn, of Pitman-Moore

Mr. Ernest Cohn, Pitman-Moore Company advertising manager, died Nov. 29, 1955, in Indianapolis, Ind. He was 71 years old. Mr. Cohn was to have retired December 1 after 38 years with Pitman-Moore and more than a half century in the advertising field.

A native of Indianapolis, Mr. Cohn played an important role in the early days of advertising. He was president of the Indianapolis Advertising Club in 1916-1917, and he helped found and was the first president of the Indianapolis Better Business Bureau.

In addition to his advertising activities, he edited several of the firm's publications, including *The Allied Veterinarian.*

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TAMM UDDER SUPPORTS

Prevent caking, Bruises, Self sucking, Smashed teats.

Waterproof bag serves as a container for medicinal solutions. Three sizes, *small,* 900-1100 lb. cows; *medium,* 1100-1600 lb. cows; *large,* over 1600 lb. cows.

Price $17.50 retail.
Professional discount, 30%.
Write to Dept. V1

FRANKSVILLE SPECIALTY CO.,
Franksville, Wis.

Diamond Laboratories Contribute to AVMA Research Fund

Diamond Laboratories, Des Moines, Iowa, has contributed $2,500 to the AVMA Research Fund for a graduate fellowship in veterinary medicine each year at Iowa State College.

It was particularly gratifying to receive such a grant at this time since "annual giving" to the fund is being urged as a better means of obtaining steady, continued support of the AVMA Research Fellowship Program than the sporadic fund-raising previously conducted every few years.

H.P. Helps Protect the men who protect the herds of America

with . . .

H.P. MASTITIS SYRINGES
H.P. MASTITIS TUBES
H.P. VEHICLE

Send for Literature and Professional Samples on your own letter head

HAMILTON PHARMACAL CO., INC.
Hamilton, N. Y.

gives
MULTI-effective
action

Havosept

Shaker-Top Bottle

HAVOSEPT'S activity is not affected by the temperature or hardness of water. The pH of Havosept is adjusted to that of the skin. It is free of harmful alkalis and fatty acids. Thus, the veterinarian with intolerance to alkali soaps is not adversely affected by using Havosept.

the liquid antiseptic detergent with lubricant, deodorant, and protectant properties.

HAVOSEPT is excellent for pre-operative scrubbing of both surgeon and patient. It prevents regeneration of bacterial flora. These antiseptic and protectant properties are important to you in prevention of wound contamination, and transmission of bacteria to you, the operator. Havosept is ideal as a lubricant for vaginal and rectal examination as well as for obstetrical procedures. This multi-purpose detergent also overcomes objectionable odors.

HAVER-GLOVER
Laboratories

SEE HAVER-GLOVER MESSENGER
FOR FORMULA AND PRICE

RABIES VACCINE

(Lockhart)

PHENOLIZED RABIES VACCINE CONTROLS OUTBREAK

According to Frederickson *et al.*,[1] the 1950 to 1951 rabies epizootic in St. Louis was controlled quickly, by mass vaccination of the dog population, after quarantine measures alone had failed. Neighboring communities continued to have a high incidence of rabies. Although only about 0.5 percent of the 38,006 dogs vaccinated in the clinics received modified live virus vaccine, and the overwhelming majority received the usual 20 percent phenolized vaccine of caprine and ovine origin, not a single case of postvaccinal paralysis was reported to the Health Division. These figures would indicate that the danger of postvaccinal paralysis in dogs, following administration of phenolized rabies vaccine, may have been greatly exaggerated recently.

1. Frederickson, L. E.; Willett, J. C.; Smith, J. E., and Price, E. R.: Metropolitan rabies epizootic controlled by vaccination. Vet. Med. **48** (1953) 276-279, 288.

(From The North American Veterinarian, Nov. 1953)

Experience —

The article at left as news is not new. It is timely only because it is human nature to seek the sensational, and overlook tried and time-proven methods. Phenolized rabies vaccine has been used as an efficient control measure for many years.

Efficiency —

Immunity developed by phenolized rabies vaccine (for a practical period of time) is as good as that from any other rabies vaccine, as reported by the Public Health Service.

Effort —

Throughout the years Lockhart has tried to have adequate supplies of Rabies Vaccine available for immediate shipment at all times. Even during the stress of the unprecedented demand upon the industry during the 1954 vaccination season, no one was without vaccine of Lockhart manufacture.

Emphasis— Lockhart Rabies Vaccine

is produced by veterinarians — sold only to veterinarians

ASHE LOCKHART, INC. • 800 WOODSWETHER ROAD. KANSAS CITY 5. MO.

3 three plus factors

make Jen-Sal biologicals consistently dependable

intensive research

meticulous quality control

40 years of experience

TRIPLE BACTERIN
Jen-Sal

gives triple protection in a single injection. Each 10 cc. injection is the bacterial equivalent of three separate 5 cc. injections for blackleg, malignant edema, and hemorrhagic septicemia.

Potency standardized, each 10 cc. dose carries 50% *Pasteurella multocida* with 25% each *C. chauvei* and *C. septicus.*

10 dose vials	**$1.30**
50 dose vials	**6.00**

The quality of the product you use continues to be evaluated long after each professional call is completed. Jen-Sal's three plus factors give you biologicals that meet this challenge successfully every time.

Jen-Sal

Jensen-Salsbery Laboratories, Inc.
Kansas City, Missouri